# UNITED STATES DISTRICT COURT
## FOR THE EASTERN DISTRICT OF TEXAS
## MARSHALL DIVISION

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|---|---|---|
| NETLIST, INC., | ) | |
| | ) | |
| Plaintiff, | ) | |
| | ) | |
| vs. | ) | Civil Action No. 2:21-CV-463-JRG |
| | ) | |
| | ) | JURY TRIAL DEMANDED |
| SAMSUNG ELECTRONICS CO., LTD., | ) | |
| SAMSUNG ELECTRONICS AMERICA, | ) | **Filed Under Seal** |
| INC., SAMSUNG SEMICONDUCTOR, | ) | |
| INC., | ) | |
| Defendants. | ) | |
| | ) | |

## PLAINTIFF NETLIST, INC.'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW REGARDING SAMSUNG DEFENDANTS' EQUITABLE DEFENSES

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**Cases**

Pursuant to Federal Rule of Civil Procedure 52 and the Court's Order, Plaintiff Netlist, Inc. ("Netlist") hereby submits its Proposed Findings of Fact and Conclusions of Law Regarding Samsung's equitable defenses of Equitable Estoppel (Section I), Unclean Hands (Section II), and Prosecution Laches (Section III).

## I.      EQUITABLE ESTOPPEL

### A.      Findings of Fact

#### 1.      JEDEC Patent Policy and Disclosure Requirements

[FF.I.1]      The JEDEC Solid State Technology Association ("JEDEC") is a standard-setting organization for commercial companies in the microelectronics industry.  Bench Trial Tr. at 7:19-24 (Halbert).

[FF.I.2]      JEDEC policies are set out in the JEDEC Manual of Organization and Procedure, referred to as JEDEC Patent Policy, JM21. *See* Bench Trial Tr. at 9:8-12 (Halbert); PX1067 (JM21U); DTX-02 (JM21S): DTX-08 (JM21T).  JM21 is periodically revised; however, the Parties did not identify any differences between versions relevant to the issues in this case.

[FF.I.3]      Unlike the policies of certain other standard setting organizations ("SSOs"), the JEDEC Patent Policy automatically takes RAND rights to all patents that contain Essential Patent Claims for a Standard generated by a committee on which a Committee Member is a member, regardless of disclosure. PX1067 at 0034:

> Subject to the terms and conditions of section 8.2.4, each Committee Member, as a condition of Participation, agrees to offer to license on RAND terms, to all Potential Licensees, such Committee Member's Essential Patent Claims for the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard issued during the period of membership in that committee. The licensing commitment does not apply to Essential Patents of a Committee Member where notice of a Refusal to License has been given by the Committee Member in accordance with 8.2.3.1.

*See also* JM21 at § 8.2.5 (PX1067 at 0035) ("If a Committee Member, at its discretion, elects not

to submit a License Assurance/Disclosure Form (see Annex A.3) at or before the time the ballot

closes and does not otherwise provide notice of an unwillingness to license in accordance with

8.2.3.1, the Committee Member and its Affiliates will be deemed to have agreed to offer to grant

licenses on RAND terms and conditions for all of its Essential Patent Claims of the balloted

Standard, if and as consistent with 8.2.4.").

[FF.I.4]   The JEDEC Patent Policy sets out the disclosure obligation in Section 8.2 of JM21.

PX1067 at 0030.  Section 8.2.3 addresses "Disclosure of Potentially Essential Patents," and states:

> All Committee Members **must Disclose Potentially Essential Patents**, known to
> their Representative(s) to be Potentially Essential Patents that are owned or
> controlled by that Committee Member **to the personal knowledge of the
> Representatives**. However, neither Committee Members nor Representatives shall
> have any obligation to conduct a search for Potentially Essential Patents.

PX1067 at 0033 (emphasis added).

[FF.I.5]         Under the JEDEC Patent Policy, the Committee Member "is the entity or

the company that is a member of a specific committee." Bench Trial Tr. at 150:21-24 (Gillingham);

JM21 at § 8.2.1 (PX1067 at 0030) (defining "Committee Member" as "An entity that participates

in a JEDEC committee and its Affiliates."). The "Representative" is "an individual nominated by

the member company to represent the member company on the committee." Bench Trial Tr. at

150:25-151:3 (Gillingham); JM21 § 8.2.1 (PX1067 at 0032) (defining "Representative" as "An

individual who represents a Committee Member.") Individuals who do not attend the JEDEC

meetings – i.e., who do not actually represent the member company on the committee – are not

Representatives. Bench Trial Tr. at 151:4-7 (Gillingham) ("Q. And would a person who does not

attend the meetings be a representative? A. No, a person who doesn't attend the meetings would

not be a representative.").

[FF.I.6]         According to the plain language of the JEDEC Patent Policy, the disclosure obligation applies to the individual Representative: "All Committee Members must Disclose Potentially Essential Patents, *known to their Representative(s)* to be Potentially Essential . . . ." (emphasis added).  PX1067-033.  The obligation does not apply to the Committee Member as a whole, nor any other employee of the Committee Member besides the Representative.  Bench Trial Tr. (Gillingham) at 151:8-11 ("Q. Who is the actual person under the JEDEC policy responsible for disclosure of patents? A. The person responsible is the representative who attends the meetings."). The representative is required only to disclose potentially essential patents of which they have personal knowledge, and has no obligation to search for patents. Bench Trial Tr. (Gillingham) at 151:12-18 ("Q. What patents is a representative required to disclose? A. The representative who attends the meetings is required to disclose patents to which he or she has personal knowledge. Q. And under the JEDEC policy, do committee members or representatives have an obligation to search for potentially essential patents? A. No, there's no obligation to search."); PX1067-0033 (JM21 at § 8.2.3).

[FF.I.7]         Additional portions of the JEDEC Patent Policy make clear that the Committee Member is the entity and the Representative is the individual who attends the meetings:

§ 3.4 Meeting Attendance (PX1067 at 0019):

An *individual representative* may represent only one company at any committee, subcommittee or task group meeting, and may vote on behalf of only one company on any ballot placed on the electronic voting machine.

§ 8.2.3 (PX1067 at 0033) (emphases added):

At each committee meeting, the chairperson should call to the attention *of all those present* the requirements contained in the JEDEC Legal Guides and the obligation of *all Representatives to inform the committee of any personal knowledge* they have of any Potentially Essential Patents that are owned or controlled by that Committee Member and to call for the Disclosure of Potentially Essential Patents *by Representatives*. Annex A provides information to be displayed at the beginning

of the committee meeting to satisfy the requirement. Additionally, ***all Representatives should be asked to read the statement attached to each JEDEC sign-in/attendance roster***; see Annex A for patent policy application guidelines.

Annex A.1 JEDEC Patent Policy Summary (PX1067 at 0043) (emphases added):

The commitment applies to all entities, including non-committee members, ***that have a Representative present at any point in a meeting*** of a JEDEC Committee or Task Group.

[FF.I.8]        Mr. Halbert referenced Section 8.2.2.1 to suggest that the duty of disclosure

applies to the Committee Member generally.  He testified.

Bench Trial Tr. (Halbert) at 10:1-5:

So in 8.2.2.1, it lists out the duties of committee members, and committee -- by being a committee member and participating within the committee, you agree to disclose all essential patents and to license those essential patents and patent claims on RAND terms.

Bench Trial Tr. (Halbert) at 11:1-2:

Q. And who specifically has this duty?

A. So the duty is by the committee members of that entity.

[FF.I.9]        Mr. Halbert's testimony was imprecise in that he is describing an individual

who attends meetings as a "committee member" and distinguishes this from the entity itself.  In

the JEDEC Patent Policy, the entity is the Committee Member and the individual who attends the

meetings is the Representative.  Section 8.2.2.1 states that the duty of disclosure is governed by

Section 8.2.3:

All Committee Members, as a condition of committee membership and participation, agree to Disclose Potentially Essential Patents, as set forth more fully in 8.2.3, and to offer to license their Essential Patent Claims to all Potential Licensees on RAND terms and conditions, if and as consistent with 8.2.3 and 8.2.4.

PX1067-0032.

[FF.I.10]        As discussed above, section 8.2.3 applies the duty of disclosure to patents

"***known to their Representative(s)*** to be Potentially Essential . . . ."  PX1067 at 033.

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[FF.I.11]     Mr. Halbert did not present an alternative understanding of Representative from that presented by Mr. Gillingham.

[FF.I.12]     Defendants do not argue the JEDEC Patent Policy is ambiguous.

[FF.I.13]     The Court finds that the JEDEC Patent Policy unambiguously extends the duty of disclosure only to the Representatives of the Committee Member, which are those individuals who attend the committee meetings.  The Court finds that because the Patent Policy is unambiguous, Mr. Halbert's testimony, to the extent it suggests that the duty extends to the Committee Member as an entity, is extrinsic evidence that is inadmissible to alter the plain language of the JEDEC Patent Policy.

[FF.I.14]     JEDEC representatives are required to disclose "Potentially Essential Patents." JM21 at § 8.2.3 (PX1067 at 0033). "Potentially Essential Patent" is defined as "A Patent that is reasonably believed by a subject person to contain one or more Essential Patent Claims." JM21 at § 8.2.1 (PX106 at 0031).  "Essential Patent Claims" are defined as "Those Patent claims the use of which would necessarily be infringed by the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard."  JM21 § 8.2.1 (PX1067-0031).

[FF.I.15]     Under the JEDEC Patent Policy, disclosure of a patent is deemed to include all patents in the same family.  The Patent Policy states that "Disclosure of a patent is deemed to include all patents claiming priority of a single filing."  JM21 at 8.2.1 (PX1067 at 0031); Bench Trial Tr. (Gillingham) at 137:8-13 ("Q. Does the JEDEC policy say anything about whether disclosure of a patent extends to other patents in the family? A. Yes, it does. Q. And what does the policy say? A. The policy states that disclosure of a patent is deemed to include all patents claiming priority to a single filing.").

[FF.I.16]        The window to disclose patents to JEDEC ends 30 days after a final version

of the Standard is approved.  The JEDEC Patent Policy states that "disclosures or notices of known

Potentially Essential Patents shall be delivered to the JEDEC Legal Department within thirty (30)

calendar days of Approval by the Committee in order to be effective."  JM21 at § 8.2.3 (PX1067

at 0034); Bench Trial Tr. at 146:19-20 (Gillingham) ("I think 30 days after committee approval of

a standard there is no further obligation to disclose.").  This is consistent with the fact that, 30 days

after a Standard is approved, any actually essential patents are automatically subject to a RAND

commitment whether or not they were disclosed.   JM21 at § 8.2.5 (PX1067 at 0035) ("If a

Committee Member, at its discretion, elects not to submit a License Assurance/Disclosure Form

(see Annex A.3) at or before the time the ballot closes and does not otherwise provide notice of an

unwillingness to license in accordance with 8.2.3.1, the Committee Member and its Affiliates will

be deemed to have agreed to offer to grant licenses on RAND terms and conditions for all of its

Essential Patent Claims of the balloted Standard, if and as consistent with 8.2.4."); Bench Trial Tr.

(Gillingham)  at 152:1-6 ("Q. Why does the disclosure obligation cease 30 days after approval of

the standard? A. Well, one reason why is once the patent has been published, all essential patent

claims, whether or not they have been disclosed to JEDEC, the JEDEC members will – are

automatically committed to RAND terms at that point.").

[FF.I.17]        Mr. Halbert did not dispute that the duty of disclosure ends as to a specific

Standard.  He testified only that a duty of disclosure applies separately to different Standards.

Bench Trial Tr. (Halbert) at 13:23-14:1 ("Q. So, Mr. Halbert, if a company makes a disclosure for

one standard, does that then count for later. standards? A. No.")

[FF.I.18]        When a Committee Member has withdrawn from the committee, there is no

ongoing duty of disclosure.  Bench Trial Tr. (Gillingham) at 141:5-11 ("Q. Is it the regular course

of practice at JEDEC for a company like Netlist to disclose patents when it was withdrawn from

JEDEC? A. No, and it's -- it would not be the policy and it would, frankly, be impossible because

Netlist was not privy to the discussions or the documents created during the time period when they

were absent."). Bench Trial Tr. (Halbert) at 16:20-17:2 ("A. So, as I said, when you issue a refusal

to license, the company must withdraw from JEDEC, and they have 120 days to withdraw. Q. Can

they go to meetings? A. No, they can't go to meetings, they don't get any email, nothing. Q. Do

they get to vote on proposals? A. No.")

[FF.I.19]      The JEDEC Patent Policy defines essentiality with reference to claims.

Therefore, the fact that a patent specification discloses an embodiment that is present in a required

section of a Standard does not trigger a duty of disclosure if there are no pending claims that satisfy

the definition of Potentially Essential Patent Claims. Bench Trial Tr.  (Gillingham) at 141:12-18

("Q. And is it the regular practice at JEDEC to disclose potentially essential patents where claims

have not yet been filed? A. Well, potentially essential patents are defined as those that are

reasonable -- a person could reasonably conclude contain one or more essential patent claims, so

if the claims don't exist, there's really no obligation to disclose."). Mr. Halbert agrees. Bench

Trial Tr. (Halbert) at 10:15-18 (Q. Now, can there be two patents with the same written description

and different claims and one be essential and one be not essential? A. Yes.")

[FF.I.20]      The JEDEC Patent Policy states that a patent disclosure should include "the

Standard(s) on which the submitter of the disclosure believes an Essential Patent Claim may read."

JM21 at § 8.2.1 (PX1067 at 0031).  However, both sides' experts agreed at trial that there is no re-

disclosure obligation, or practice to re-disclose, for a continuation of an existing standard. *See*

JM21 at § 8.2.4 (RAND commitment applies "a continuation of a prior Standard"); Bench Trial

Tr. (McAlexander) at 107:23-108:5 ("Q. And you didn't tell the Court that the RAND commitment

obligation extends to standards that are merely a continuation. There's no redisclosure obligation when it's merely a continuation of a previous standard. Correct? A. ***There is a clause in there that does say that***. I didn't cover that, but that's certainly still directed to DDR4 only. That doesn't mean there's extension to an entirely different product line."); *id.* (Gillingham) at 139:7-20 ("Q. In the regular practice at JEDEC, is there a practice to redisclose patents that have already been disclosed? A. No, there's not a practice to redisclose patents relating to a continuation of a prior standard to which the patent had initially been disclosed. Q. And why is it the practice not to re-disclose for a continuation of a prior standard? A. Well, JEDEC participants would be well aware that -- if I take the example of DDR4 and DDR5, that most if not all of the features of DDR4 would be carried over into DDR5, and then there would be some additional features added to achieve the higher performance that -- you know, of DDR5. So the members would be able to look at the past history of those features through the previous versions of the standard.").

> **2.     Samsung Has Not Proven By Clear and Convincing Evidence that Netlist Violated Any Duty of Disclosure**
>
>> a.      There Is No Clear and Convincing Evidence that Netlist's JEDEC Representative Mr. Martinez Knew of Potentially Essential Patents and Failed to Disclose Them During the Required Time Period.

[FF.I.21]      The Court finds that Samsung failed to prove by clear and convincing evidence that Netlist violated any JEDEC disclosure duty as to the '918/'054 patents.  The duty of disclosure is specific to Representatives, i.e. the individual who represents the company at JEDEC meetings, and limited to potentially essential patents of which the representative has personal knowledge.   JM21 at § 8.2.3 (PX1067 at 0033) ("All Committee Members must Disclose Potentially Essential Patents, ***known to their Representative(s)*** to be Potentially Essential Patents that are owned or controlled by that Committee Member ***to the personal knowledge of the Representatives***.") (emphases added); Bench Trial Tr. (Gillingham) at 151:8-14 ("Q. Who is the

actual person under the JEDEC policy responsible for disclosure of patents? A. The person responsible is the representative who attends the meetings. Q. What patents is a representative required to disclose? A. The representative who attends the meetings is required to disclose patents to which he or she has personal knowledge.").

[FF.I.22]     There is no obligation by the Representative to search for potentially essential patents.    JM21 at § 8.2.3 (PX1067 at 0033) ("[N]either Committee Members nor Representatives shall have any obligation to conduct a search for Potentially Essential Patents."); Bench Trial Tr. (Halbert) at 11:24-12:2 ("Q. Now, is there an obligation for member companies to go out and actively search for patents? A. No, there's no obligation. In fact, it states there's no obligation to search for patents"); *id.* (Gillingham) at 151:15-18 ("Q. And under the JEDEC policy, do committee members or representatives have an obligation to search for potentially essential patents? A. No, there's no obligation to search.").

[FF.I.23]     At the bench trial, Mr. McAlexander showed the following demonstrative:
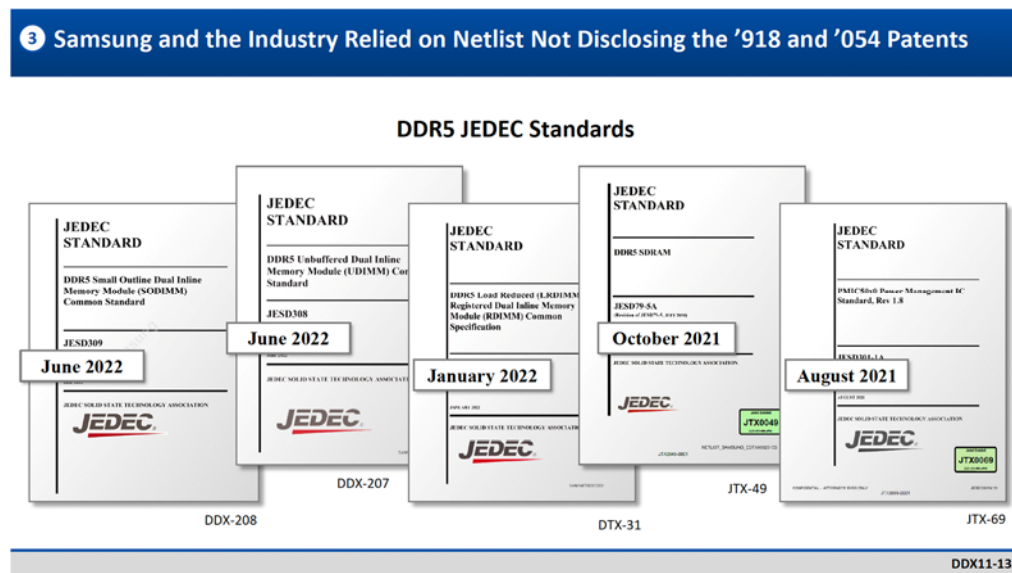


[FF.I.24]     Only three of the JEDEC Specifications on Mr. McAlexander's demonstrative are in evidence.  DTX-31 (DDR5 LRDIMM/RDIMM), JTX-49 (DDR5 SDRAM),

and JTX-69 (PMIC50x0 Power Management IC Standard) (the "PMIC Specification").  At the bench trial, Mr. McAlexander only discussed one portion of the PMIC Specification, JTX-69, as relevant to the '918 and '054 patents.  Bench Trial Tr. at 77:15-78:7.  He discussed no other substantive portion of any other specification relating to DDR5.

[FF.I.25]     Netlist's JEDEC representative for the committee that developed the DDR5 PMIC Specifications (JC-40) is Mario Martinez.  Bench Trial Tr. (Milton) at 62:15-21 ("Q. And we heard testimony from Mr. Mario Martinez earlier. Right? A. Yes, sir. . . . Q. And he is the Netlist representative at JEDEC. Correct? A. He represents Netlist as a member company, yes."), *id.* at 29:6-19 (Mr. Martinez attendance at DDR5 JEDEC meetings).  Mr. Martinez was also Netlist's representative for JC-42 and JC-45 committees.  Bench Trial Tr. at 28:3-17.

[FF.I.26]     Mr. Martinez testified that he did not have personal knowledge of any essential patents.  Bench Trial Tr. (Martinez) at 30:23-31:6 ("Q. So is it your testimony now that you personally have personal knowledge about which patents are essential to the JEDEC standards? A. No, I do not have personal knowledge. I just know that our patents are based on products which can cover multiple areas. And per the JEDEC discussions at the board level, those patents can read on multiple technologies going forward. So I'm basing my comment on JEDEC portfolio board of director comments.").

[FF.I.27]     With respect to the '918 and '054 patents, there was no evidence that Mr. Martinez (1) had personal knowledge of the '918 and '054 patents and believed they contained Potentially Essential Patent Claims, and (2) knowingly failed to disclose them to the JEDEC JC-40 committee.

[FF.I.28]     At the bench trial, Defendants suggested that an attempt to avoid a disclosure obligation by isolating the Representative from knowledge of the entity's patents would

violate the JEDEC Patent Policy.  *See* Bench Trial Tr. at 145:3-25 (cross examination of Gillingham).  This represents an attempt to import a duty as to how a Representative is selected by the Committee Member, which is not present in the plain language of the JEDEC Patent Policy. Because the Patent Policy unambiguously places no criteria on the selection of the Representative, the Court declines to import any duty in terms of Representative selection into the Policy.  *See* Bench Trial Tr. (Gillingham) at 150:25-151:18 ("Q. And who is the representative?  A. The representative is an individual nominated by the member company to represent the member company on the committee. Q. And would a person who does not attend the meetings be a representative? A. No, a person who doesn't attend the meetings would not be a representative. Q. Who is the actual person under the JEDEC policy responsible for disclosure of patents? A. The person responsible is the representative who attends the meetings.").

[FF.I.29]    Nonetheless, there is no evidence of willful blindness or a practice of non-disclosure on the part of Mr. Martinez.  Mr. Martinez testified that when he was aware of patents, he disclosed them.  *See* Bench Trial Tr. (Martinez) at 24:14-16 ("We try to be as compliant as possible with the JEDEC patent policy, so we are very aggressive on our disclosures."), *id*. at 25:13-20 ("The way that I would facilitate the information coming from JEDEC, I would write up a report that would summarize, at a high level, the activity on certain standards and then come back to the office and provide a download to our technical experts who then reviewed it. And -- and there could be some takeaways from that where we had to go execute on something or we had to come back to JEDEC and report something.").  A prime example of this is that as soon as JEDEC began to discuss hybrid memory modules, Mr. Martinez disclosed that Netlist had fundamental IP in the space. PX0708 at 0005 (highlight added):

**Minutes of Meeting No. 164**
**JC-40 Digital Logic Committee**
December 9, 2010                                                    San Francisco, CA
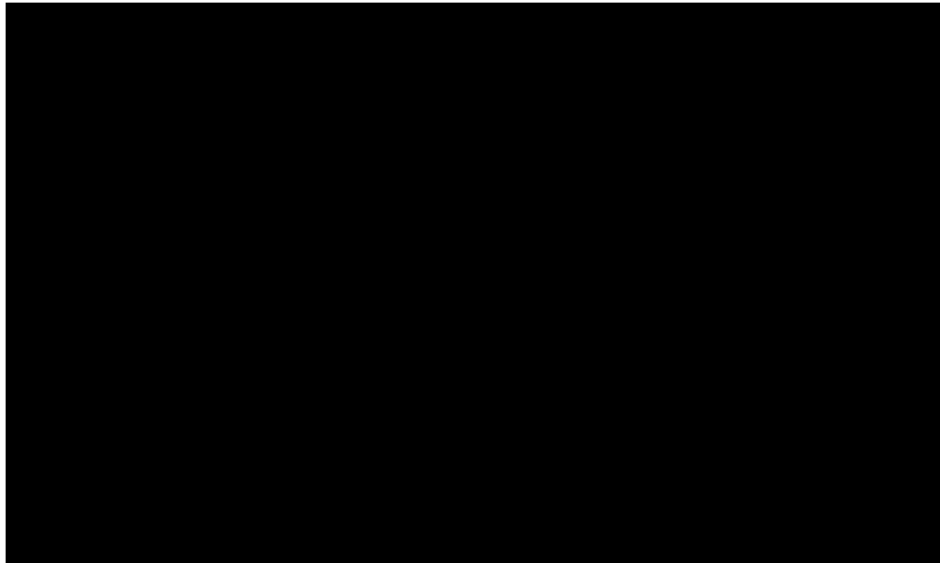


Discussion:
- Netlist indicated that they have IP on the fundamental concepts described in the showing, and will provide information to JEDEC consistent with the patent policy.

*See also* Bench Trial Tr. (Gillingham) at 150:14-16 ("Did Netlist disclose to JEDEC that it had IP on fundamental aspects of hybrid memory? A. Yes, they did.").

[FF.I.30]        Samsung's reference at trial to press releases that Netlist put out about the claim construction and jury verdict in this Court in 2022 and 2023 do not establish any knowledge or failure to disclose.  Bench Trial Tr. (Milton) at 61:18-62:14.  The press releases are not in evidence. Further, there was no evidence that Mr. Martinez was aware of the press releases and, even if he was, neither press release contains any assertion the '918 or '054 patents satisfy the definition of Potentially Essential Patent Claims.

[FF.I.31]        Further, even if Mr. Martinez believed that the '918/'054 patents contained "Potentially Essential Patent Claims" when first filed in December 2020 and May 2021, by this point in time the window for disclosure had closed.  The approved PMIC Specification was released in June 2020.  Bench Trial Tr. (Gillingham) at 140:21-23 ("Q. When was the approved

DDR5 PMIC standard publicly released? A. The approved standard was publicly released in June 2020."); JTX0069-0201 (JESD301-1 released "June 2020").  Netlist did not file the applications for the '918 and '054 patents until December 2020 and May 2021 respectively, JTX0003, JTX0004.  Therefore, by the time the claims existed, there was no duty to disclose because any actually essential claims were automatically subject to RAND.  Bench Trial Tr. (Gillingham) at 141:12-18 ("Q. And is it the regular practice at JEDEC to disclose potentially essential patents where claims have not yet been filed? A. Well, potentially essential patents are defined as those that are reasonable -- a person could reasonably conclude contain one or more essential patent claims, so if the claims don't exist, there's really no obligation to disclose.").

[FF.I.32]     Mr. McAlexander made reference to the fact that the '416 application patent claims were amended in 2019 such that "the hybrid memory portion was eliminated." Bench Trial Tr. (McAlexander) at 92:3-6.  Mr. McAlexander, however, did not present any analysis or allegation of the '416 application patent claims were Potentially Essential Claims or that Mr. Martinez believed them to be so.

[FF.I.33]     Moreover, to the extent Defendants maintain that subsequent revisions to JESD301-1 re-trigged a duty of disclosure, this is inconsistent with the JEDEC Patent Policy, which holds that a "continuation" of a pre-existing Standard is treated as the same Standard.  *See* JM21 at § 8.2.4 (PX1067 at 0034).  Every time a disclosure window exists under JEDEC policy, this represents an opportunity for the committee member to decline to offer a RAND license.  The Patent Policy states that "disclosures or notices of known Potentially Essential Patents shall be delivered to the JEDEC Legal Department within thirty (30) calendar days of Approval by the Committee in order to be effective."  JM21 at § 8.2.3 (PX1067 at 0034); *id*. at § 8.2.5 (PX1067 at 0035) ("If a Committee Member, at its discretion, elects not to submit a License

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Assurance/Disclosure Form (see Annex A.3) at or before the time the ballot closes and does not

otherwise provide notice of an unwillingness to license in accordance with 8.2.3.1, the Committee

Member and its Affiliates will be deemed to have agreed to offer to grant licenses on RAND terms

and conditions for all of its Essential Patent Claims of the balloted Standard, if and as consistent

with 8.2.4.").  If a duty of disclosure opened up each time there was a revision of a Specification,

this would mean a refusal to RAND window would open as well, which defeats the purpose of the

JEDEC Patent Policy which automatically captures all patents once the disclosure window closes.

> b.      Disclosure of the '918/'054 Patent Family to JEDEC Satisfied the
>         Patent Policy

[FF.I.34]      Even if Mr. Martinez had a duty of disclose as to the '918/'054 patents, the

Court finds that Samsung has failed to prove by clear and convincing evidence that Netlist

breached such duty, because Netlist disclosed the '918/'054 patent family to JEDEC.

[FF.I.35]      The JEDEC Patent Policy states that "Disclosure of a patent is deemed to

include all patents claiming priority of a single filing."  JM21 at § 8.2.1 (PX1067 at 0031); Bench

Trial Tr. (Gillingham) at 137:8-13 ("Q. Does the JEDEC policy say anything about whether

disclosure of a patent extends to other patents in the family? A. Yes, it does. Q. And what does the

policy say? A. The policy states that disclosure of a patent is deemed to include all patents claiming

priority to a single filing.").

[FF.I.36]      JEDEC requires disclosure of patents as early as reasonably possible.  JM21

at § 8.2.3 (PX1067 at 0033) (emphasis added):

> Disclosure of Potentially Essential Patents by a Representative or the Committee
> Member being represented shall be made **as early as reasonably possible**. The
> Disclosure of Potentially Essential Patents shall be in accordance with the definition
> of Disclosure of Potentially Essential Patents, see 8 .2.1. Initial disclosure by a
> Committee Member or Representative may be made in a meeting of the committee
> or task group. The Representative is responsible for ensuring that such disclosure
> is properly recorded in the meeting minutes.

[FF.I.37]        At the bench trial, Mr. McAlexander showed the following demonstrative:
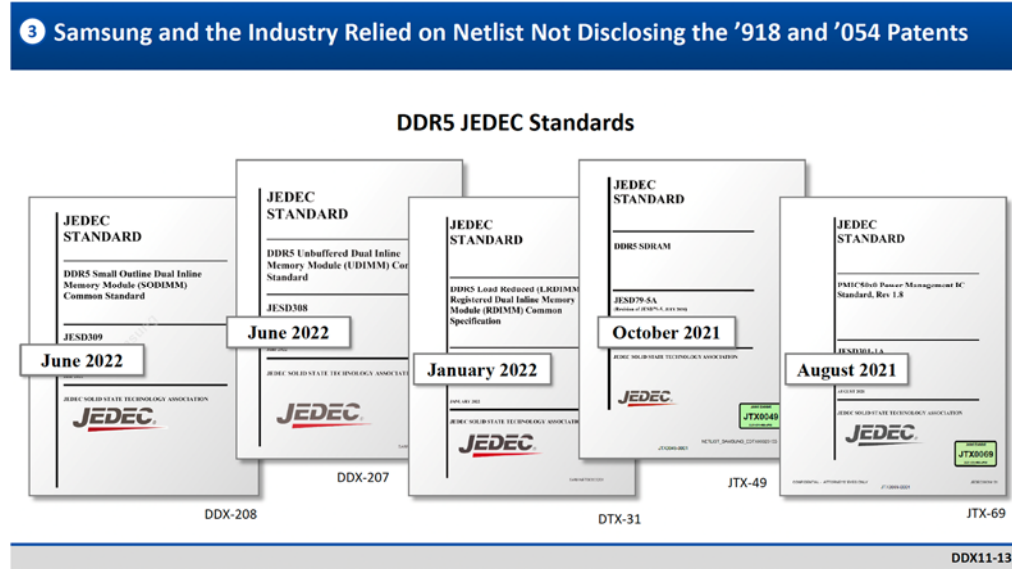


[FF.I.38]        Only three of these of the specifications on Mr. McAlexander's demonstrative are in evidence.  DTX-31 (DDR5 RDIMM/LRDIMM), JTX-49 (DDR5 SDRAM), and JTX-69 (PMIC50x0 Power Management IC Standard) (the "PMIC Specification").  At the bench trial, as to the '918/'054 patents, Mr. McAlexander only discussed one portion of the PMIC Specification, JTX-69.  *See* Bench Trial Tr. at 77:15-78:7.  He discussed no other substantive portion of any other specification.  JTX0049 makes no reference to on module power management.  And as discussed in, e.g. Paragraph FF.II.56, DTX-31 places no requirements on the internal structure of the PMIC employed on the module, only on its inputs and outputs.

[FF.I.39]        JTX-69 describes a logic component that is present on an NVDIMM, LRDIMM, or RDIMM and outputs power to other components on the module (JTX69 at 0013):

## 2.1    Description

The PMIC5000 & PMIC5010 is designed for typical DDR5 RDIMM, DDR5 LRDIMM as well as various types of DDR5 NVDIMM application. The PMIC features four step down switching regulators and three LDO regulators.

The PMIC is designed to support approximately 15 Watts of power. The PMIC is powered from VIN_Bulk input for switching regulators and VIN_Mgmt input for the rest of the PMIC. The PMIC supports selectable interface (I²C or I3C Basic) to fit various application environment. The PMIC device is intended to operate up to 12.5 MHz on a 1.0 V I3C Basic bus or up to 1 MHz on a 1.0 V to 3.3 V I²C bus.

[FF.I.40]    Mr. McAlexander testified that the specification for DDR5 on-module power management applies to NVDIMM, LRDIMM, and RDIMM.  Bench Trial Tr. (McAlexander) at 105:14-16 ("Q. And the specification for PMIC applies to NVDIMM, LRDIMM and RDIMM. Correct? A. As I recall, yes, that's correct--for DDR5.").

[FF.I.41]    The PMIC Specification describes a controller with non-volatile memory on the power controller (JTX69 at 0014):

JEDEC Standard No. 301-1A
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- Automatic switchover from VIN_Mgmt input supply to VIN_Bulk input supply
- Error injection capability
- Persistent Error log registers
- Write protect mode and programmable of operation
- Independently programmable output voltages, power up and power down sequence for switch regulators
- Input and output power good status reporting mechanism
- VIN_Bulk input supply protection feature: Input over voltage
- Output switch regulators protection feature: Output over voltage, output under voltage, output current limiter
- Output current and power measurement, output current threshold mechanism
- Temperature measurement, temperature warning threshold, critical temperature shutdown
- Multi Time Programmable Non-Volatile Memory
- Programmable and DIMM specific registers for customization
- General Status Interrupt Function
- Flexible Open Drain IO (I²C) and Push Pull (I3C Basic) IO Support

[FF.I.42]    The non-volatile memory is in a register.  JTX69-0118.

Table 94 — Register 0x04

| Bits | Attribute | Default | Description[1,2] |
|---|---|---|---|
| 7 | ROE | 0 | R04 [7]: GLOBAL_ERROR_COUNT<br>Global Error Count Since Last Erase Operation[3]<br>0 = No Error or Only 1 Error since last Erase operation<br>1 = > 1 Error Count since last Erase operation |
| 6 | ROE | 0 | R04 [6]: GLOBAL_ERROR_LOG_BUCK_OV_OR_UV<br>Global Error Log History for Buck Regulator Output Over or Under Voltage[4]<br>0 = No Error Occurred<br>1 = Error Occurred |
| 5 | ROE | 0 | R04 [5]: GLOBAL_ERROR_LOG_VIN_BULK_OVER_VOLTAGE<br>Global Error Log History for VIN_Bulk Over Voltage[4]<br>0 = No Error Occurred<br>1 = Error Occurred |
| 4 | ROE | 0 | R04 [4]: GLOBAL_ERROR_LOG_CRITICAL_TEMPERATURE<br>Global Error Log History for Critical Temperature[4]<br>0 = No Error Occurred<br>1 = Error Occurred |
| 3:0 | RV | 0 | R04 [3:0]: Reserved |

1. The PMIC always attempts to write this register into its non-volatile memory. However, it may not be guaranteed depending on how fast the host may shut off the input power to the PMIC. The PMIC needs minimum of 5.0V for VIN_Bulk voltage and 200 ms duration from PWR_GOOD signal assertion to guarantee the write operation into non-volatile memory.

[FF.I.43]    Mr. McAlexander testified that non-volatile memory is flash. Jury Trial Tr. (McAlexander) at 938:19-20 ("Q. And non-volatile memory, flash is non-volatile memory? A. Flash is a type of non-volatile, yes.").

[FF.I.44]    Mr. McAlexander testified that the JC-40 committee was responsible for implementing on module power management. Bench Trial Tr. (McAlexander) at 105:11-13 ("Q. And JC-40 was the committee that was responsible for designing on-module power management. Correct? A. Correct.").

[FF.I.45]    In a December 2010 meeting at the JC-40 committee, Netlist disclosed that it had "IP" on "fundamental concepts" relating to "hybrid memory," which involves "DRAM, Flash and logic (e.g, a controller)" on module. PX0708 at 0005:

- 17 -

**2.3.1.0   #FYI            Viking                Hybrid Memory**
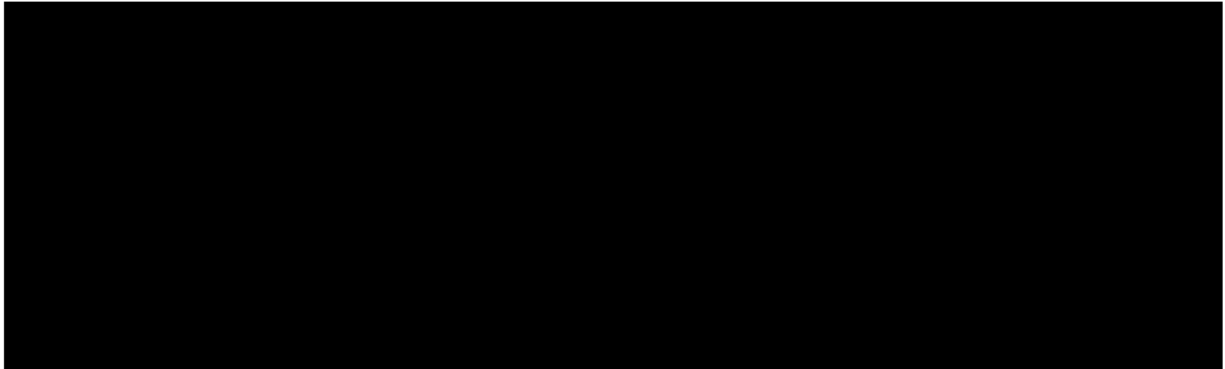


An example was shown comparing a battery backed-up system to a hybrid module.  Implementations might include DRAM, Flash and logic (e.g. a controller).

A new sub-committee was formed in JC-45 (JC-45.6) - the first activities will be to prepare a scope for the new sub-committee.

Discussion:
- Netlist indicated that they have IP on the fundamental concepts described in the showing, and will provide information to JEDEC consistent with the patent policy.

[FF.I.46]      Samsung was present at this meeting, as were representatives of the two

other current manufacturers of DDR5 DRAM, Hynix and Micron. PX0708 at 0001-0002:

**Minutes of Meeting No. 164**
**JC-40 Digital Logic Committee**
December 9, 2010                                                    San Francisco, CA



- 18 -
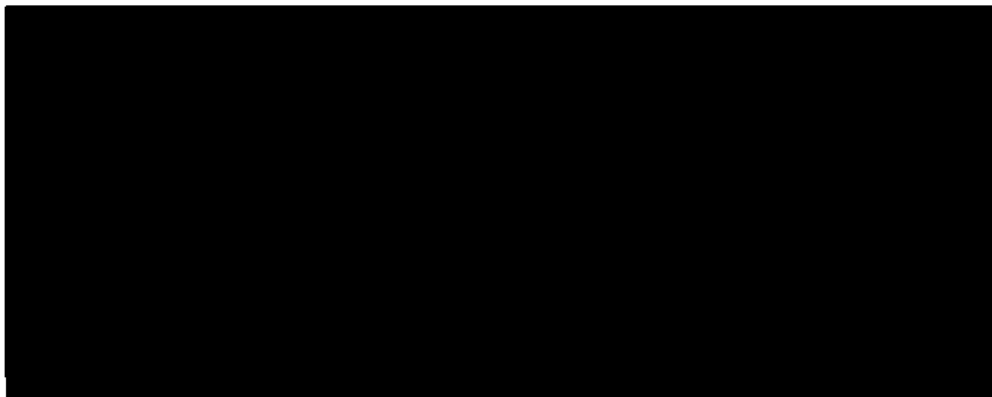
Minutes of Meeting No. 164
JC-40 Digital Logic Committee
December 9, 2010                                         San Francisco, CA
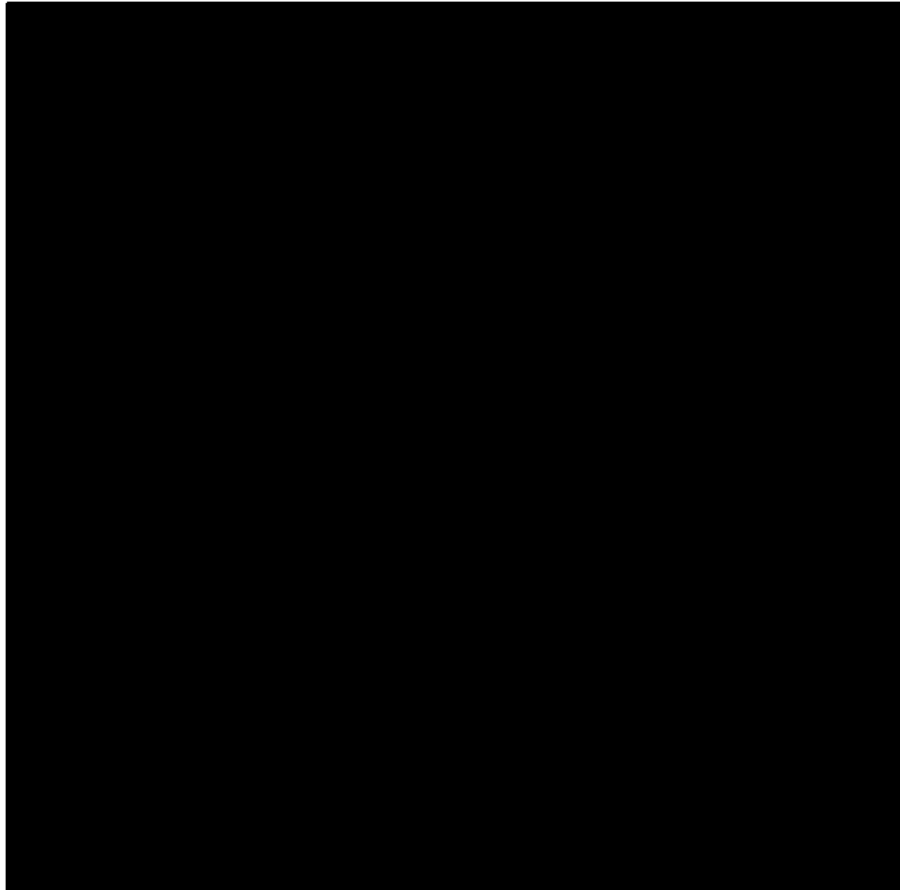


100692:mwk:1/16/11              Page 1 of 16

Plaintiff's Exhibit

**PX0708**

2:21-CV-463-JRG

SAM-NET00078119

PX0708-0001

[FF.I.47]        At the jury trial, Netlist argued that NVDIMM and DDR5 were both species

of hybrid memory because of the presence of flash in the controller (PMIC) on the module:

> Q. And the NVDIMM is the hybrid memory that we talked about with
> the DRAM and the flash. Correct?
>
> A. That's correct.

Jury Trial Tr. (Milton) at 247:4-6.

> Q. Do you have -- from a technology standpoint, is there a relationship between
> Samsung's DDR5 and NV and hybrid?

A. I believe that that is true, yes.

Q. Why?

A. So for two reasons. One is, is that the -- the PMIC that we've been talking about, which is the -- which includes the power management, does have flash in it. That flash is used to save information about the state of the system so it could be debugged in the event of failure, which is something that the -- we actually also did on the original product we had. And the second thing is, is that this power management functionality was taken from, you know, as been stated, a hybrid product. So by putting that on the standard modules, we've essentially made those hybrid products. They're incorporating things that we use from hybrid into now today standard products.

Jury Trial Tr. (Milton) at 308:6-21.

Q. Is Samsung's on-module power management applicable to all types of DIMMs, including NVDIMMs?

A. Well, they say that it works with DDR5 RDIMMs, LRDIMMs, and NVDIMMs.

Jury Trial Tr. (Mangione-Smith) at 332:23-333:2.

[FF.I.48]    One of the primary bases on which Netlist argued that written description existed for its patent claims was that on-module power management with flash on the chip is an example of hybrid memory.  Jury Trial Tr. at 306:13-307:24 (inventor Milton testimony); *id*. at 986:5-988:9 (cross-examination of Mr. McAlexander).  Netlist prevailed on written description at trial.

> (1)    *Disclosure to JC-40 for Item Number 314.22 Was the Earliest Possible Disclosure to what Became the PMIC Specification.*

[FF.I.49]    In 2015 and 2018, Netlist disclosed the '831 and '833 Patents to JEDEC, which are predecessors of the '918/'054 patents and claim priority to the same parent application. Bench Trial Tr. (Gillingham) at 106:1-10; 137:22-138:12 (showing demonstratives below); JTX0003; JTX0004.
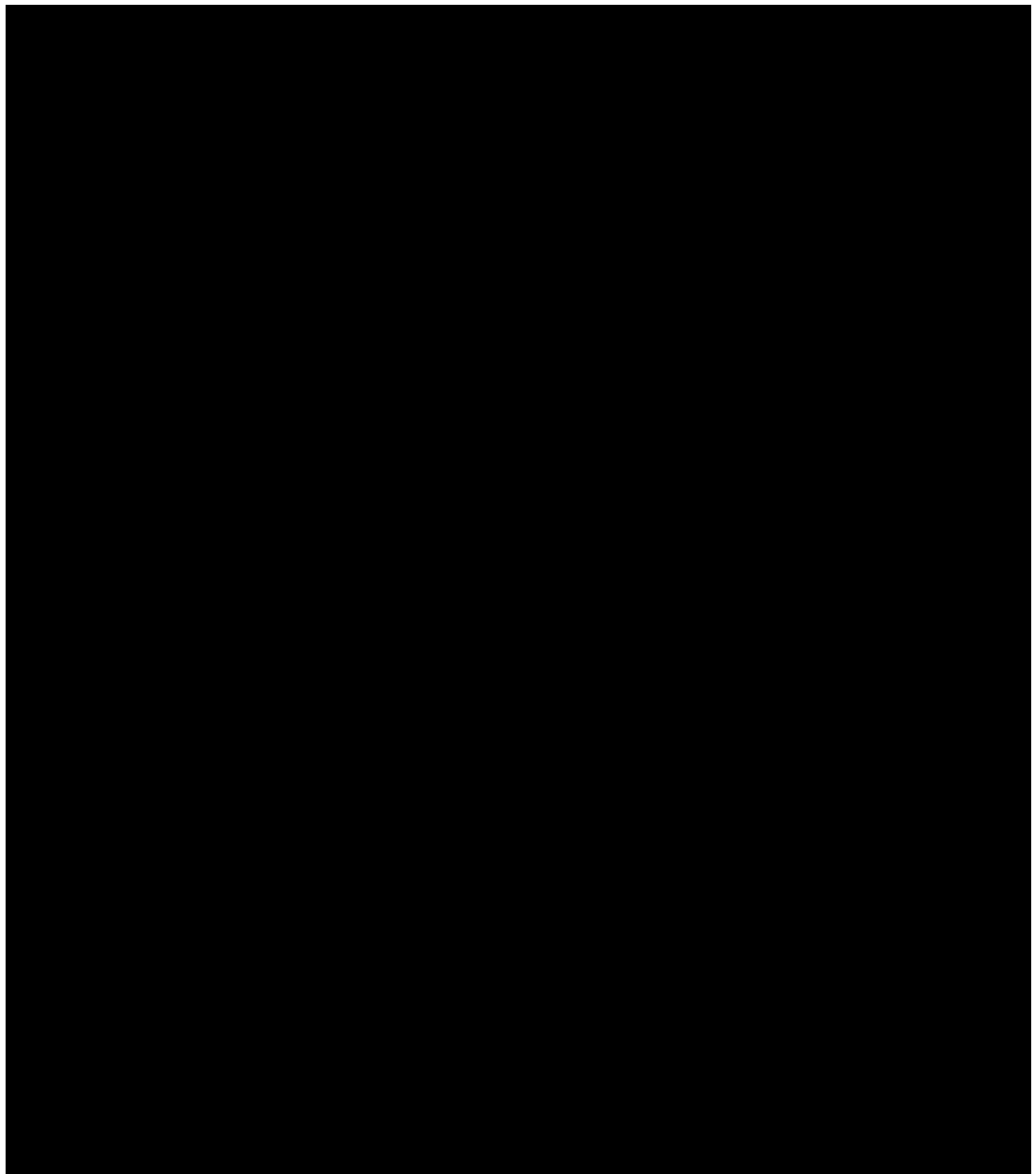
The claims as filed with the priority specification contained claims to on-module power management.   *See below* FF.III.4-6.  Thus, if a JEDEC member in JC40 actually did want to

consider the scope of rights Netlist had, a review of the original specification of, for example, the

'833 patent, would make clear this included on-module power management.

[FF.I.50]      Mr. McAlexander testified on direct examination that Item Number 314.22

had no relation to DDR5 and was "targeted narrowly to DDR4."

> Q. And is that what you're referencing here on slide 10?
>
> A. Yes. In this representation to JEDEC where the requirement was to identify the relevant JEDEC standards, the only ones that were identified here were that this '831 Patent the claims would be applicable to the DDR4 RCD 02 LC0M protocol and the RCD definition, so it was specifically targeted narrowly to DDR4 and specific topics within DDR4.
>
> Q. Now, in reference to this DTX 10 at 47, does item No. 14 reference here specified -- relate at all to DDR5?
>
> A. No, not at all.
>
> Q. Does Item No. 314 relate at all to PMIC?
>
> A. No, not at all.

*See* Bench Trial Tr. (McAlexander) at 83:17-84:3.

[FF.I.51]      Based on what follows, the Court finds that Defendants have not proven this

assertion by clear and convincing evidence.

[FF.I.52]      The relevant feature of Samsung's DDR5 modules that is at issue in the case

is on-module power management.  Jury Trial Tr. (McAlexander) at 996:9-10 ("You agree that

Samsung's DDR5 products employ on-module power management.  Correct?  A. Correct,")

[FF.I.53]      In March 2014, ██████████████████████

██████████████████████████████████████████████

██████████████████████████████████   PX0856 at 5-6:

3.4.2.0   #313.01   HP                    Voltage Regulator on DDR4 DIMM

Page 5 of 13
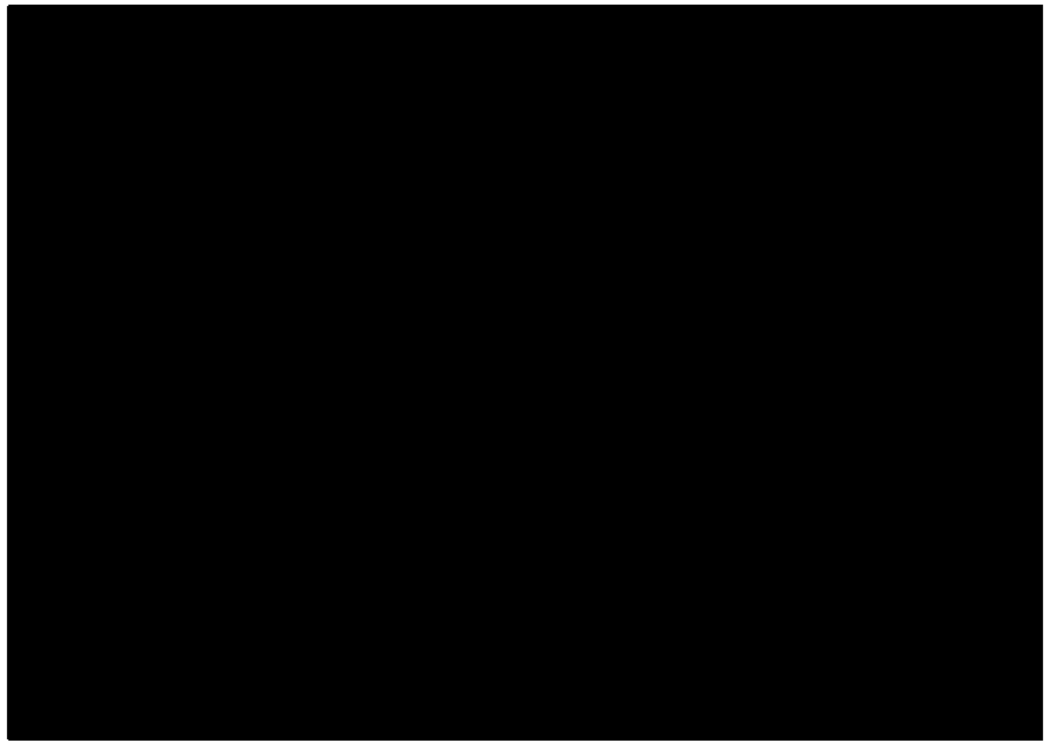
[FF.I.54]      The ballot recited in Netlist's disclosure, Item No. 314.22, is related to the following devices for which JEDEC publishes specifications: DDR4, NVDIMM, RDIMM, LRDIMM, NVDIMM, RCD.  PX1790 at 1:

**JEDEC.**

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## COMMITTEE LETTER BALLOT

Committee: JC-40.4

Committee Item Number: 314.22

**Subject:** Proposed DDR4 RCD02 LCOM Protocol and RCW Definitions

**Background:** At the December 2014 committee meeting the DIMM Register/Buffer task group obtained authorization to issue ballots for DDR4RCD02 NV mode including LCOM interface protocol and RCW registers for control and commands.

On February 2$^{nd}$, 2015, task group TG404_1 reached consensus for approving this ballot to be placed in the voting machine.

All contents are ballot material.

**Keywords:** DDR4, RDIMM, LRDIMM, NVDIMM, RCD, Register, DDR4RCD02

> Comment
>
> 2015.2.12   Micron

Ballot Template Version draft rev. 8/11
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**Plaintiff's Exhibit**
**PX1790**
2:21-CV-463-JRG

SAM-NET00174879

PX1790-0001

[FF.I.55]     The ballot recited in Netlist's disclosure, Item No. 314.22, references power

management. PX1790 at 0006:

- 25 -

DDR4 RCD02 LCOM Protocol and RCW Definitions                    Item 314.22
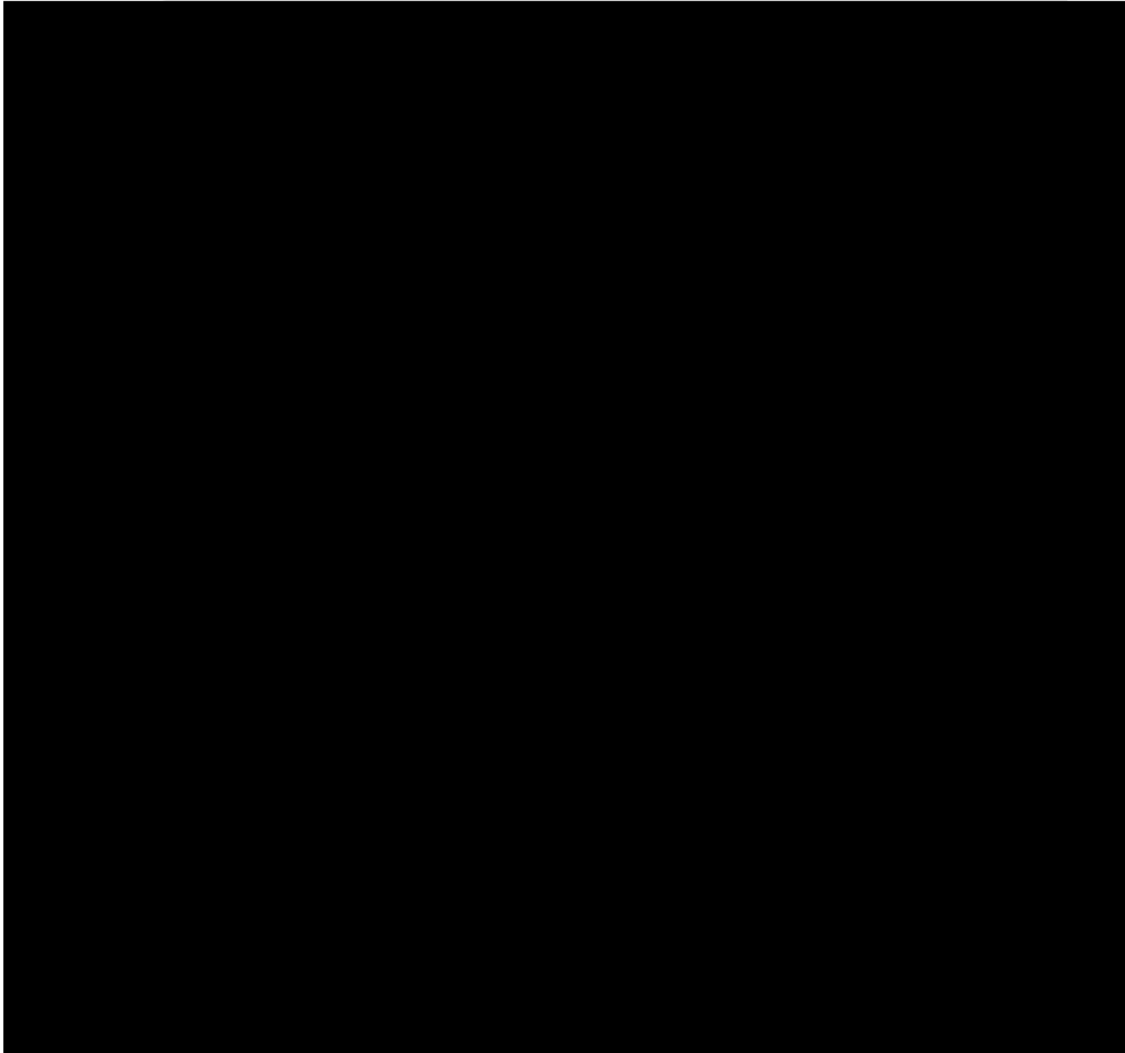
Page 6 of 8

PX1790-0006

[FF.I.56]        The ballot recited in Netlist's disclosure, Item No. 314.22, references the

combination of NVDIMM and LRDIMM/RDIMM. PX1790 at 0007:

- 25 -
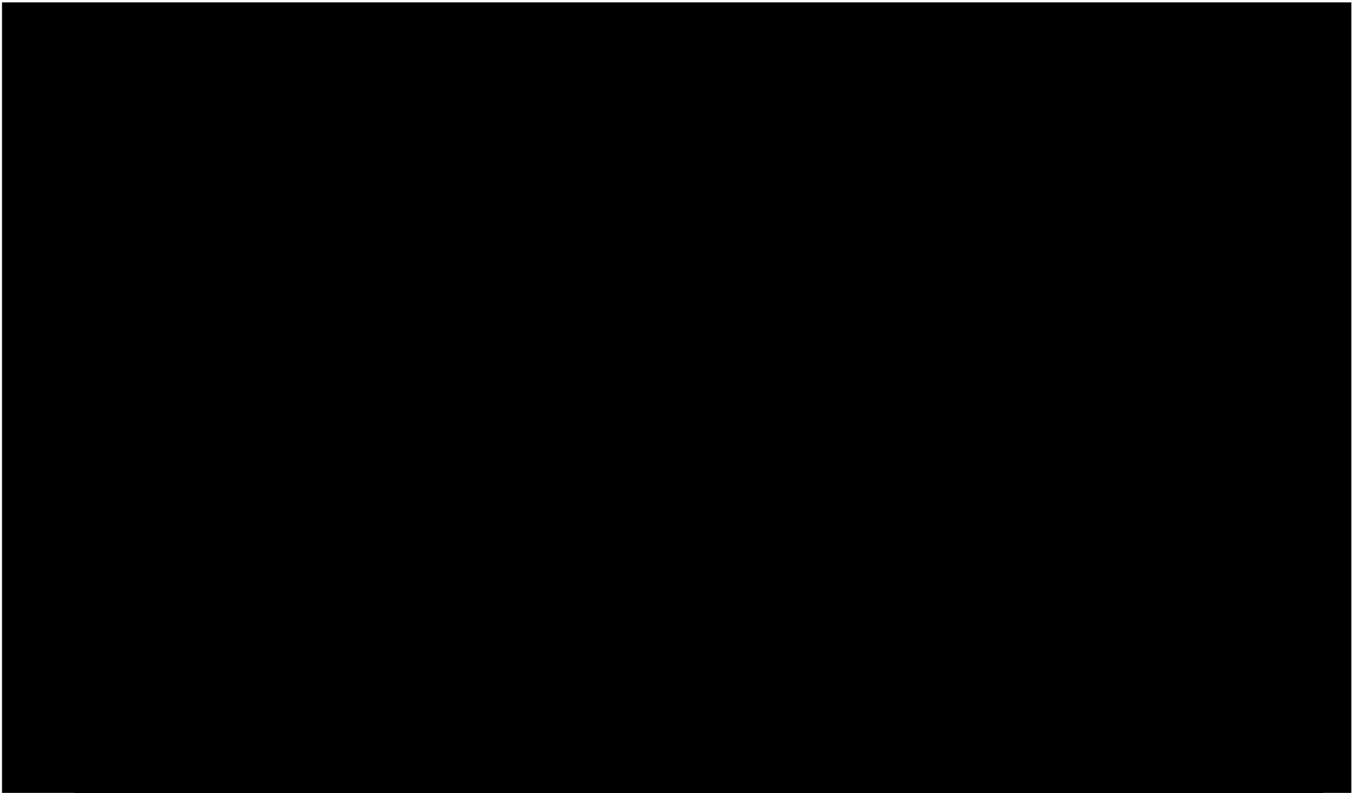
[FF.I.57]      The President of Samsung Memory testified that NVDIMM first had on-

module power management and that now Samsung's DDR5 products have this feature as well.

> Q. DDR5 has power management control on the module?
>
> A. Yes, and it has the name of PMIC.

Jury Trial Tr. (Jung Bae Lee) at 636:24-25.

> Q. Sir, you understand that NVDIMM designs have power management integrated
> circuits on module. Correct?
>
> A. Yes, and that was also something that I was able to remind myself based on the
> document that you showed me.

Jury Trial Tr. (Jung Bae Lee) at 638:23-639:1.

[FF.I.58]      Consistent with this, Samsung designs its PMICs for use with NVDIMM as

well as RDIMM and LRDIMM.  JTX0011 at 0054:

- 27 -
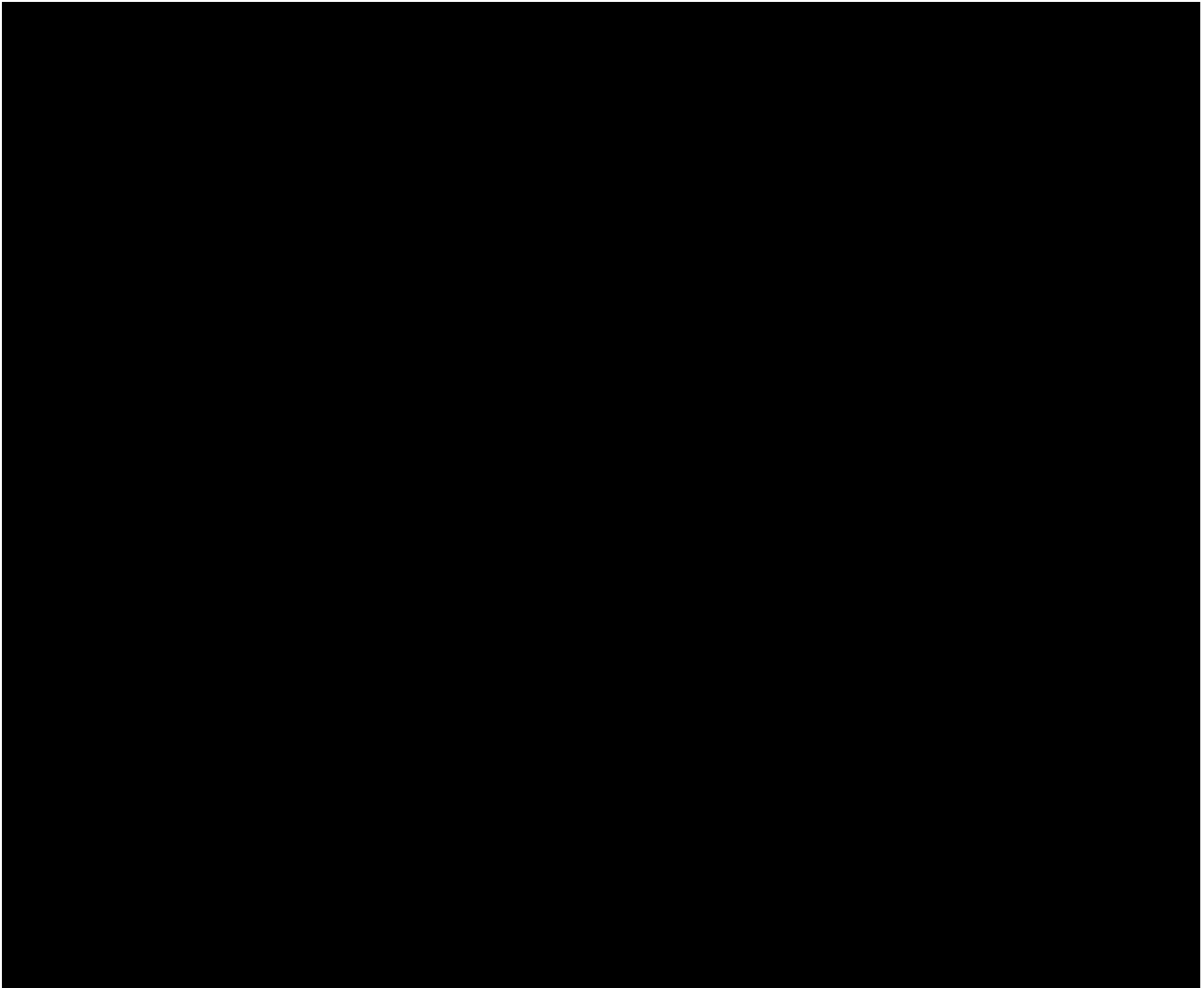
[FF.I.59]         Mr. Gillingham, on cross-examination, testified that Item No. 314.22

related to on-module power management, and that this evolved into the JEDEC PMIC

specification.

> Q. Right. In fact, there's no PMIC in DDR4. Isn't that right?
>
> A. This entire proposed standard under Item 314 was for applying -- for adding power management to certain DDR4 DIMMs.
>
> Q. Sir, there is no PMIC in DDR4. Isn't that right?
>
> A. I'm not aware of a standard for the DDR -- for a DDR4 PMIC component, but I am aware of a standard for a DDR4 non-volatile DIMM NVDIMM that includes a power management --
>
> Q. And that's because PMIC was a new component for DDR5. Isn't that right, sir?

A. The PMIC component may have first been defined at JEDEC for DDR5, but on the DDR4 non-volatile DIMM, there must have been some kind of component that we could put the PMIC label on.

Bench Trial Tr. (Gillingham) at 148:22-149:10.

[FF.I.60]    When shown both PX0856 and PX1790, Mr. McAlexander testified that in 2014/2015 on-module power management was being combined with the RCD, a logic device present on the module.

Q. Now, the ballot number, PX 1790, relates to RCDs and to NVDIMM. Is that correct?

A. For DDR4.

Q. And if you look at PX 856, you understand that at the time in 2014 the proposal was for on-module power management to be on DDR4 -- it was being proposed in DDR4 for the RCD. You understand that?

A. I understand there was a proposal for DDR4. That's correct.

Q. And in PX 856, it talks about that the on-module power management will be in the RCD. Correct?

A. That's correct. It was not done, but yes, that was discussed at that time.

Q. And that was what was being discussed before Samsung -- Netlist exited the committee in 2015. Correct?

A. That is correct.

Q. And that's the -- what they disclosed it to, that RCD JC-40 committee that was discussing on-module power management company in 2014 and '15. Correct?

A. Specifically as proposed on the DDR4, and that was the target.

Bench Trial Tr. (McAlexander) at 106:11-107:6.  The proposal for adding on-module power management by creating a more advanced RCD logic chip that included this function (PX0856 and PX1790) evolved into single function logic chips that delivered on-module power management as reflected in PMIC Specification.  This was likely the result of comments that "RCD manufacturers may not be experienced in power controllers."  PX0856 at 0006.

[FF.I.61]    Mr. McAlexander also testified on cross-examination that DDR5 DIMMs are an extension and further development of DDR4 DIMMs.

Q. And you testified that DDR5 DIMMs are an extension -- DDR5 DIMMs are an extension in further development of DDR4. Correct?

A. I testified to that and also mentioned that this morning as well.

Bench Trial Tr. (McAlexander) at 107:18-22.

[FF.I.62]     Mr. McAlexander also testified that nowhere in his report did he assert that DDR5 DIMM was a new standard, as opposed to a continuation of a prior standard.

Q. Did you address in your report a claim that DDR5 DIMM is not -- is a new standard, not merely a continuation of a prior standard?

A. I don't recall having that, no.

Bench Trial Tr. (McAlexander) at 110:11-14.

[FF.I.63]     Moreover, unlike the JEDEC specifications for LRDIMM/RDIMM (DTX-31) and SDRAM (JTX0049) which are specifically entitled "DDR5," the specification for on-module power management ICs (JTX0069) is not limited to DDR5 ("PMIC50x0 Power Management IC Standard"), corroborating the position that the PMIC Specification is a continuation of work begun at DDR4.

[FF.I.64]     The fact that PX0856 and PX1790 were not adopted but continued to subsequently evolve into what became the PMIC Specification as Mr. Gillingham observed does not make the disclosure improper. The JEDEC Patent Policy requires disclosure "as early as reasonably possible" (Section 8.2.3) and makes clear that the disclosure duty applies as to proposed Standards that have not yet been adopted (PX1067 at 0032):

Standard: Standards include publications and package outlines, provided that they are adopted (or intended to be adopted) by the JEDEC Board of Directors and have the effect of Standards. Standards work includes activities in JEDEC committees and task groups.

NOTE Standards include both ***proposed*** and adopted JEDEC technical specifications.

[FF.I.65]        Netlist's JEDEC representative Mario Martinez testified that it was Netlist's

policy to make aggressively early disclosures.  This testimony is corroborated by the disclosures

discussed above.

> Q. And what guidelines are provided as to what is a reasonable amount of time?
>
> A. Well, for Netlist it's -- it's when first observed. We try to be as compliant as possible with the JEDEC patent policy, so we are very aggressive on our disclosures. I don't know about other members. I can't speak for them.

Bench Trial Tr. (Martinez) at 24:12-17.

[FF.I.66]        Mr. McAlexander testified that DDR5 is an extension and continuation of

DDR4, but that DDR5 and DDR4 modules are not interchangeable.

> Q. And you testified under oath that DDR5 is an extension and continuation of DDR4. Correct?
>
> A. Again, with clarification. I said this morning there is an extension, but they're not compatible, they're not replaceable. You can't take one out and put the other one in. They have many features that are not at all the same.

Bench Trial Tr. (McAlexander) at 108:11-16.

[FF.I.67]        The JEDEC Patent Policy does not treat the absence of backwards

compatibility as the test for when a re-disclosure needs to occur.   Section 8.2.3 requires disclosure

as "early as possible" and the definition of Standards includes "***proposed*** . . . JEDEC technical

specifications," which as a matter of grammar and logic may not be adopted or may evolve.

[FF.I.68]        Based on the evidence presented, a PMIC is a logic chip with a register on

the module that controls power management for DIMMs including NVDIMMs.  On-module power

management using logic chips, and registers on logic chips that could work with NVDIMM, were

the subject of PX1790 and in PX0856, which led to the Netlist disclosure at issue.

(2)     *There Is No Clear and Convincing Evidence that Mario Martinez Believed the Disclosure Was Defective*

[FF.I.69]     The 2015 disclosures of the '831/'833 Patents were refusals to license. Mr. Halbert and Mr. Martinez testified that as a result of this refusal to license, Netlist withdrew from all JEDEC committees in 2015 and no longer received access to any materials:

> Q. When Netlist withdrew from JEDEC, how did that impact its ability to participate in JEDEC?
>
> A. So, as I said, when you issue a refusal to license, the company must withdraw from JEDEC, and they have 120 days to withdraw.
>
> Q. Can they go to meetings?
>
> A. No, they can't go to meetings, they don't get any email, nothing.

Bench Trial Tr. (Halbert) at 16:18-25.

> Q. What was the effect of Netlist no longer being members of the JC-40, -42, and -45 committees?
>
> A The effect is no visibility on standards that are – or proposals that are being standardized within JEDEC. We would only see the final specifications at the board level

Bench Trial Tr. (Martinez) at 28:3-7.

[FF.I.70]     In August of 2018, Netlist returned to the committees by issuing notices of willingness to license for the same patents that it previously refused to license, retroactive to 2015. In other words, the notices of refusal were converted to notice of agreement to license effective as of 2015.

> Q. What permitted Netlist to return to JEDEC in August of 2018?
>
> A. They issued notice that they are willing then to license their patents under RAND terms.
>
> Q. And was that notice then retroactive to February of 2015?
>
> A. Yes.

Bench Trial Tr. (Halbert) at 17:11-16.

- 32 -

[FF.I.71]     Netlist, which did not have access to materials prepared by the committee between 2015 and 2018, disclosed the same item numbers it used in 2015.  Left, PX0949 at 21, right, PX0176 at 33:
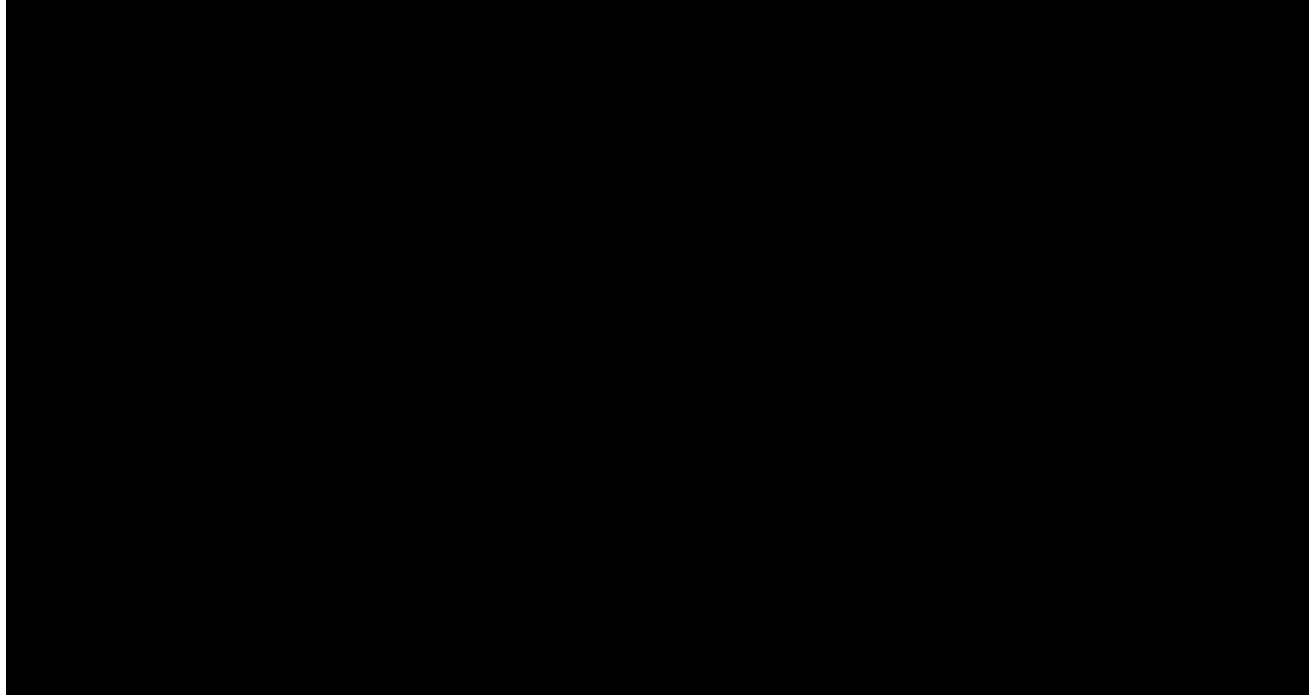


Left, PX0949 at 19, right, PX0176 at 31:
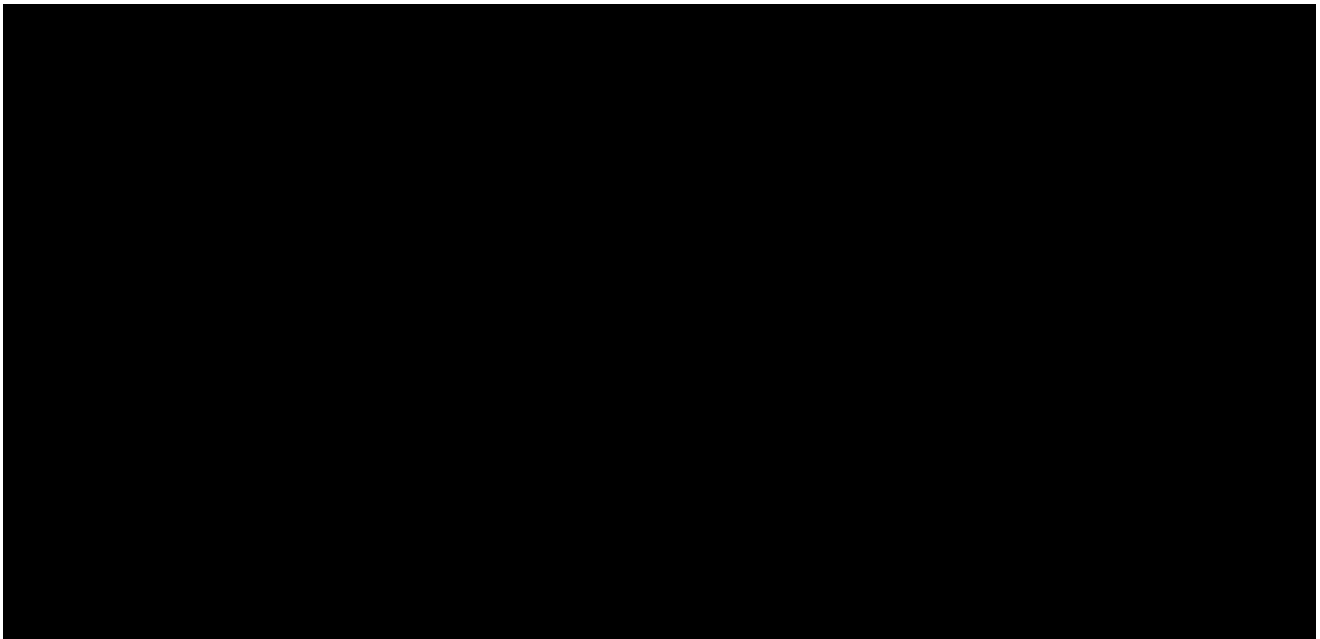
[FF.I.72]        Netlist withdrew from JEDEC committees during the 2015-2018 time period. JM21 at § 8.2.3 (PX1067 at 0033) (applying to "committee members"), § 8.2.3.1 (PX1067 at 0034) ("if the Committee Member wishes to maintain its position that it would refuse to License the work of the committee, the Committee Member must withdraw from the committee no later than one-hundred twenty (120) calendar days after providing notice of its unwillingness to license").

[FF.I.73]        There is no obligation for companies that are not members of JEDEC committees to disclose patents, including during a withdrawal period.   Bench Trial Tr. (Gillingham) at 141:5-11 ("Q. Is it the regular course of practice at JEDEC for a company like Netlist to disclose patents when it was withdrawn from JEDEC? A. No, and it's -- it would not be the policy and it would, frankly, be impossible because Netlist was not privy to the discussions or the documents created during the time period when they were absent.").

[FF.I.74]        During the withdrawal period, Netlist had no access to committee materials or the ability to participate in committee discussions.  In order to return to the JEDEC committees, Netlist re-disclosed the '833 and '831 patents to JEDEC converting refusals to RAND to RAND commitments. Bench Trial Tr. (Gillingham) at 141:19-22 ("Q. Did Netlist take any action once it returned to the JEDEC committees after its withdrawal? A. Yes, they did. They immediately submitted RAND letters for those patents.").

[FF.I.75]        The JEDEC Patent Policy states "Disclosure of Potentially Essential Patents by a Representative or the Committee Member being represented shall be made as early as reasonably possible.  The Disclosure of Potentially Essential Patents shall be in accordance with the definition of Disclosure of Potentially Essential Patents, see 8.2.1."  PX1067 at 0033.  The

definition of Disclosure of Potentially Essential Patents focuses in all instances on the "belief" of

the submitter. *See* PX1067 at 31:

**Disclosure of Potentially Essential Patents** (to Disclose Potentially Essential Patents): Disclosure to JEDEC, in writing, in the following form:

a)  for issued patents, disclose the patent owner, assignee (if available at time of disclosure) name, address and intellectual property rights ("IPR") contact person; name or title of the patent; the patent number; the country or countries of issuance, and the Standard(s) on which the submitter of the disclosure believes an Essential Patent Claim may read,

b)  for published applications, disclose the patent application owner, assignee (if available at time of disclosure) name, address and IPR contact person; name or title of the patent; the patent application number; the country or countries of filing, and the Standard(s) on which the submitter of the disclosure believes an Essential Patent Claim may read, and

c)  for unpublished pending applications, disclose the name or title of the patent application, the patent application owner or assignee (if available at time of disclosure) name, address and the IPR contact person; the patent application number; the general subject matter of such unpublished application(s) and the Standard(s) on which the submitter of the disclosure believes an Essential Patent claim may read.  Nothing herein precludes broader disclosure of unpublished patent applications on a voluntary basis or pursuant to a non-disclosure agreement.

Disclosure of a patent is deemed to include all patents claiming priority of a single filing. The listing of foreign equivalents is optional and at the discretion of the patent holder.

NOTE   If any of a Committee Member's disclosed patent or patent application contains Essential Patent Claims which, if licensed, would require a payment of royalties or other material consideration to an unaffiliated third party, the Committee Member must also note this fact in its disclosure statement.

[FF.I.76]        Netlist's JEDEC representative Mr. Martinez provided the following

testimony about the disclosure of Item No. 314.

> Q. And -- and trying to understand whether that refers to a specification for the RCD for DDR4. Is -- is that the case?
>
> A. This here refers to a number of specifications that are part of RCD because there are multiple protocols and multiple definitions for registers within the device.

Bench Trial Tr. (Martinez) at 29:1-5.  In other words, he recognized that this disclosure

corresponded to multiple different specifications, consistent with the cover of Item No.

314, which lists DDR4 as only one of the relevant "Keywords."   *See* PX1790:

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## COMMITTEE LETTER BALLOT

Committee: JC-40.4

Committee Item Number: 314.22

Subject:    Proposed DDR4 RCD02 LCOM Protocol and RCW Definitions

Background:  At the December 2014 committee meeting the DIMM Register/Buffer
task group obtained authorization to issue ballots for DDR4RCD02 NV
mode including LCOM interface protocol and RCW registers for control
and commands.

On February 2$^{nd}$, 2015, task group TG404_1 reached consensus for
approving this ballot to be placed in the voting machine.

All contents are ballot material.

Keywords:    DDR4, RDIMM, LRDIMM, NVDIMM, RCD, Register, DDR4RCD02

Comment

2015.2.12  Micron

Ballot Template Version draft rev. 8/11
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**Plaintiff's Exhibit**

**PX1790**

SAM-NET00174879

2:21-CV-463-JRG

PX1790-0001

[FF.I.77] Netlist's JEDEC representative Mr. Martinez testified that he believed Netlist

technology applied across DDR generations.

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Q. Did you submit a license assurance form that particularly identified any patents and particularly identified any DDR5 PMIC specification?

A. So we submit -- we develop products and we have patents that we submitted on those products, and they can consist of many different ideas on that. And when we submit those – when we submit the RANDs to JEDEC, upon first disclosure, we provide the necessary information that's available for – for -- that was given to me by the -- the legal counsel and also the patent engineer, to submit that to JEDEC under RAND or non-RAND purposes. So those essential patents are -- regardless of technology, per JEDEC, those -- those patents read on current technologies and for future technologies. So whether it's DDR3, DDR4, DDR5, it doesn't matter.

Q. So just to clarify here, because now it seems like you're saying that you do know which patents are essential and which patents are not; earlier you said you didn't know, that that was analysis done by somebody else. So I just want to clarify here, which is your test testimony. Are you saying you know which Netlist patents are essential to the JEDEC standards or are you saying you don't know?

A. What I'm saying is that we submit these potential essential patents per the RAND or non-RAND policy for JEDEC. They are affiliated with products. Those products have multiple ideas on it. What that means is that when we submit those patents to the JEDEC office to inform them of the disclosures, those patents can read on any kind of technology. That is from a high-level perspective.

Q. So is it your testimony now that you personally have personal knowledge about which patents are essential to the JEDEC standards?

A. No, I do not have personal knowledge. I just know that our patents are based on products which can cover multiple areas. And per the JEDEC discussions at the board level, those patents can read on multiple technologies going forward. So I'm basing my comment on JEDEC portfolio board of director comments.

Bench Trial Tr. (Martinez) at 29:20-31:6.

[FF.I.78]      Defendants have not proven by clear and convincing evidence that Mr. Martinez believed that the disclosure to Item No. 314.22 related to a different "Standard" than the PMIC Specification that is the subject of Defendants equitable estoppel claim.  As a result, Defendants have not proven by clear and convincing evidence that a violation of disclosure obligation occurred by a failure to disclose the '918/'054 patent family with the item number that was used.

[FF.I.79]        Samsung's JEDEC expert Mr. Halbert testified that if a representative

believes a patent has Potentially Essential Patent Claims to two different standards, disclosure to

only one of those standards is insufficient:

> Q. So, Mr. Halbert, if a company makes a disclosure for one standard, does that
> then count for later standards?
>
> A. No.

Bench Trial Tr. (Halbert) at 13:23-14:1.

[FF.I.80]        Mr. Halbert testified that he had no experience with the patent disclosure

process at JEDEC:

> Q. Mr. Halbert, when you were the technical representative at Intel, you had no role
> in making decisions about disclosing patent rights to JEDEC. Correct?
>
> A. That is correct.

Bench Trial Tr. (Halbert) at 21:3-6.

[FF.I.81]        Mr. Halbert did not testify that the PMIC Specification represented a

different Standard than Item No. 314.22, as opposed to the culmination of work that was ongoing

since 2015 to expand the logic functionality on-module, as reflected in Item No. 314.22.

> (3)        *The PMIC Specification Is a Continuation of the JC-40 Work*
>            *Netlist Identified and Therefore a New Disclosure Was Not*
>            *Necessary*

[FF.I.82]        Netlist's JEDEC expert Mr. Gillingham testified that the course of dealing

at JEDEC is not to disclose continuations of a "Standard."

> Q. In the regular practice at JEDEC, is there a practice to redisclose patents that
> have already been disclosed?
>
> A. No, there's not a practice to redisclose patents relating to a continuation of a
> prior standard to which the patent had initially been disclosed.
>
> Q. And why is it the practice not to redisclose for a continuation of a prior standard?
>
> A. Well, JEDEC participants would be well aware that -- if I take the example of
> DDR4 and DDR5, that most if not all of the features of DDR4 would be carried
> over into DDR5, and then there would be some additional features added to achieve

the higher performance that -- you know, of DDR5. So the members would be able to look at the past history of those features through the previous versions of the standard.

Bench Trial Tr. (Gillingham) at 139:7-20.

[FF.I.83]      Mr. Gillingham testified that DDR5 is continuation of DDR4:

Q. Do you have an understanding of whether DDR5 is a continuation of the DDR4 standard?

A. Yes. DDR5 is a continuation of the DDR4 standard.

Q. And how does JEDEC actually identify the DDR4 and DDR5 standards?

A. Well, they are identified by the standard number. So in the case of DDR4, that is standard JESD79-4, and for DDR5, the standard number is JESD79-5. So clearly the 5 is a continuation of the 4.

Q. Now, has Samsung expressed a view in this case about whether DDR5 is a continuation of DDR4?

A. Yes, they have.

Q. What view did Samsung express?

A. Well, Samsung's expert Mr. McAlexander stated that DDR5 DIMMs are an extension and further development of DDR4 DIMMs.

Bench Trial Tr. (Gillingham) at 139:21-140:10.

[FF.I.84]      Mr. Gillingham's opinion has support in the JEDEC Patent Policy, which

draws a distinction between a "new Standard" and "merely a continuation of a prior Standard."

Although this discussion occurs in the context of when a RAND commitment attaches, there is no

evidence that the term "Standard" is used differently in Section 8.2.4 (which relates to the RAND

obligation) and Section 8.2.3 (Disclosure of Potentially Essential Patents).  PX1067 at 0034:

**8.2.4 RAND Patent Licensing Commitment**

Subject to the terms and conditions of section 8.2.4, each Committee Member, as a condition of Participation, agrees to offer to license on RAND terms, to all Potential Licensees, such Committee Member's Essential Patent Claims for the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard issued during the period of membership in that committee. The licensing commitment does not apply to Essential Patents of a Committee Member where notice of a Refusal to License has been given by the Committee Member in accordance with 8.2.3.1.

This commitment applies to any Standard that was pending in the committee or task group while the Committee Member Participated in that committee or task group. If a Committee Member terminates its committee membership, the commitment does not apply with respect to any new proposal or Standard introduced in the committee or task group after the Committee Member provided notice to the JEDEC Legal Department terminating its committee membership. If and as necessary, questions whether or not a particular proposal is a new Standard or merely a continuation of a prior Standard will be addressed in the first instance by the JEDEC Legal Department in accordance with 8.2.10.

Certain exceptions apply to the licensing requirement. A Committee Member will not be required to license or continue to license its Essential Patent Claims to a Potential Licensee for a particular Standard if: (i) such Potential Licensee does not agree to grant a license to all other Potential Licensees under such Potential Licensee's Essential Patent Claims of that Standard on RAND terms and conditions for the approved Standard and/or (ii) such Potential Licensee has commenced or has threatened to commence patent litigation targeting such Committee Member's products that are meant to comply with that Standard.

[FF.I.85]     Mr. Halbert did not dispute this analysis. Moreover, if Defendants claim that the PMIC Specification is a new Standard" and not "merely a continuation" it was obligated to present this question to the JEDEC Legal Department. JM21 at § 8.2.4 ("questions about whether or not a particular proposal is a new Standard or merely a continuation of a prior Standard will be addressed in the first instance by the JEDEC Legal Department in accordance with 8.2.10"). Defendants presented no evidence at trial that this step was taken.

[FF.I.86]     The definition of "Standard" in the JEDEC Patent Policy provides no additional guidance. PX1067 at 32:

> "Standards include publications and package outlines, provided that they are adopted (or intended to be adopted) by the JEDEC Board of Directors and have the effect of Standards. Standards work includes activities in JEDEC committees and task groups."

[FF.I.87]     The structure of the JEDEC Patent Policy confirms a broad understanding of a "continuation of a prior Standard." For the period of time that an entity is a Committee

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Member of a committee, its Essential Patent Claims for a Standard that has its source in that specific committee are RAND encumbered automatically (Section 8.2.4) unless the Committee Member files a refusal to RAND (Section 8.2.3.1).  As a result, the JEDEC Patent Policy provides for the concept of a "continuation of a Standard" such that if a Committee Member leaves a committee, an automatic RAND obligation that existed during the Committee Members' presence on the Committee does not disappear simply because the Standard changes over time.  Simply put, JEDEC's Patent Policy seeks an expansive definition of Standard that encompasses evolution and change without allowing for re-disclosure.  If re-disclosure is allowed, a company then retains the ability to withdraw the RAND commitment.  If Samsung's assertion that Netlist had to re-disclose each time the discussion of on-module power management evolved is correct, this would give Netlist the opportunity to refuse to RAND each time, which would defeat the purpose of the Patent Policy which was to prevent Committee Members from being given new opportunities to refuse to offer a RAND license.

[FF.I.88]        Mr. McAlexander also testified on cross-examination that DDR5 DIMMs are an extension and further development of DDR4 DIMMs:

> Q. And you testified that DDR5 DIMMs are an extension -- DDR5 DIMMs are an extension in further development of DDR4. Correct?
>
> A. I testified to that and also mentioned that this morning as well.

Bench Trial Tr. (McAlexander) at 107:18-22.

[FF.I.89]        Consistent with this testimony, Mr. Gillingham testified that DDR5 is denominated numerically as a continuation of DDR4:

> Q. And how does JEDEC actually identify the DDR4 and DDR5 standards?
>
> A.  Well, they are identified by the standard number. So in the case of DDR4, that is standard JESD79-4, and for DDR5, the standard number is JESD79-5. So clearly the 5 is a continuation of the 4.

Bench Trial Tr. (Gillingham) at 139:24-140:4.

[FF.I.90]      Mr. McAlexander also testified that nowhere in his report did he assert that

DDR5 DIMM was a new standard, as opposed to a continuation of a prior standard:

> Q. Did you address in your report a claim that DDR5 DIMM is not -- is a new
> standard, not merely a continuation of a prior standard?
>
> A. I don't recall having that, no.

Bench Trial Tr. (McAlexander) at 110:11-14.

[FF.I.91]      Mr. McAlexander testified that DDR5 was not backward compatible to

DDR4, which means a DDR5 module cannot be used in DDR4 servers, and vice versa.

> Q. And you testified under oath that DDR5 is an extension and continuation of
> DDR4. Correct?
>
> A. Again, with clarification. I said this morning there is an extension, but they're
> not compatible, they're not replaceable. You can't take one out and put the other
> one in. They have many features that are not at all the same.

Bench Trial Tr. (McAlexander) at 108:11-16.

[FF.I.92]      The concept of "continuation" versus a "new" Standard as set out in the

JEDEC Patent Policy does not use backward compatibility as the test for when a standard is "new."

Indeed, this would lead to all pre-existing technology that was present in DDR4 and also used in

DDR5 to not be subject to automatic RAND commitments if the entity left the committee after

DDR4.  Such an outcome is contrary to the expressed intent of the JEDEC Patent Policy, which is

to constrain the ability of Committee Members to withdraw their patents from a RAND

commitment.

[FF.I.93]      The Court finds that Samsung has not proven by clear and convincing

evidence that the PMIC Specification is a "new Standard" as opposed to a continuation of

"Standards" discussed in Item No. 314.22.

### 3. Samsung Has Not Proven by Clear and Convincing Evidence that it Relied on Any Non-Disclosure or Suffered Material Prejudice

[FF.I.94]     The Court finds that even if there was a failure to disclose, Samsung has not proven by clear and convincing evidence that it relied on any such non-disclosure or that it suffered prejudice.

[FF.I.95]     Samsung's 30(b)(6) corporate representative regarding its participation in JEDEC, Mr. Hyun-Joong Kim, testified that Samsung does not recognize a duty to disclose patents:

> Q. You are here to testify on behalf of Samsung regarding Samsung's application at JEDEC and Samsung's patents. Correct?
>
> A. Yes, that's correct.
>
> Q. So is Samsung required to declare its patents that -- making (unintelligible) of the voltage regulation onboard feature?
>
> A. My understanding is that JEDEC recommends disclosure, but it's not a mandatory obligation.

Bench Trial Tr. (Hyun-Joong Kim) at 124:23-125:6.

[FF.I.96]     This was not an isolated malapropism.  Mr. Kim repeatedly emphasized that Samsung recognized no duty of disclosure:

> Q. Okay. So it's Samsung's position that it has no obligation to declare the patents relevant to the voltage regulation on DIMM feature. Is that correct?
>
> A. Well, I am simply talking about JEDEC policy. I am not at a position what Samsung should or should not disclose.

Bench Trial Tr. (Hyun-Joong Kim) at 125:7-11.

[FF.I.97]     Mr. Kim also testified that he did not know if Samsung checked for patents disclosed to JEDEC, and Samsung presented no evidence that it did so:

> Q. So if Samsung wants to know which patents have been declared as relevant to the voltage regulation volt feature, it can find those information. Correct?
>
> A. Yes.
>
> Q. But you don't have knowledge whether Samsung actually have done that. Correct?

A. Correct.

Bench Trial Tr. (Hyun-Joong Kim) at 125:7-11.

[FF.I.98]    There was no testimony by any Samsung fact witness or expert that Samsung interpreted Netlist's disclosures in JC-40 as an acknowledgment that its patents did not cover DDR5, or subjectively believed Netlist would not enforce the '918 and '054 patents.  Nor was there any testimony that Samsung made design decisions for DDR5 based on patents that had or had not been disclosed, or took any action based on the fact Netlist had not disclosed the '918 and '054 patents to JEDEC.

[FF.I.99]    Netlist disclosed directly to Samsung that it had patents regarding on-module power management, including the '918 and '054 family.  For example, in 2014, Netlist gave a presentation to Samsung stating "Seminal Patents for NV and MCI" "Intelligent On-Module power distribution: U.S. Pat. Pending."  PX0621 at 0028:
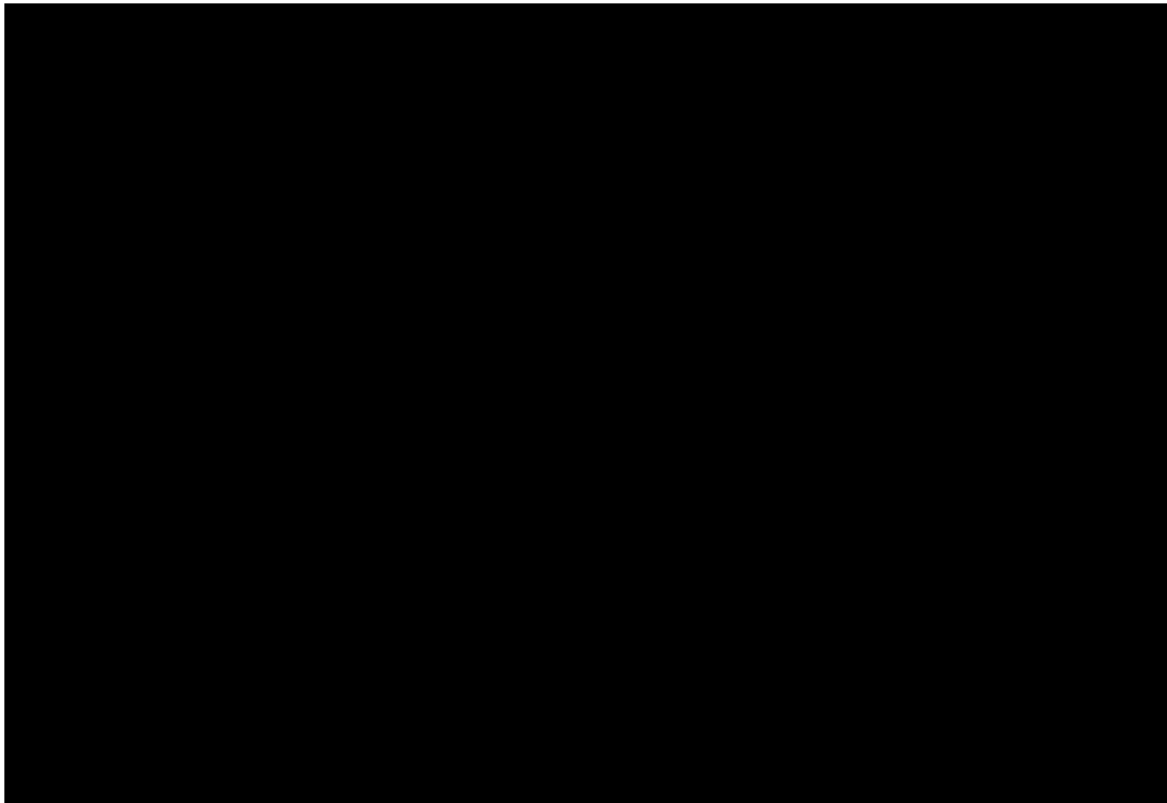
[FF.I.100]      Mr. Milton testified that this presentation was related to Samsung's DDR5

products:

> Q. So I want to show you another document. This is PX 621. Do you recognize this document?
>
> A. Yes, I do.
>
> Q. What is this document?
>
> A. So this is from a presentation that was provided to Samsung.
>
> Q. And I'm going to show you a page from this document. I showed it in opening. It says, intelligent on-module power distribution. Do you see that?
>
> A. I do.
>
> Q. And at top, it says, seminal patents for NV and memory channel interface?
>
> A. That is correct.
>
> Q. How does NV and memory channel interface relate to Samsung's DDR5 products?
>
> A. So, as mentioned, we believe that DDR5, all modules include NV in them, and all modules include the memory channel interface.
>
> Q. And by all modules, you mean all of Samsung's modules?
>
> A. That is correct.
>
> Q. And so if Samsung's Defendant -- the Defendants' counsel was suggesting that this presentation has nothing to do with Samsung's DDR5 designs, do you -- do you agree with that or do you disagree with that?
>
> A. I disagree with that.

Jury Trial Tr. (Milton) at 202:13-203:12.

[FF.I.101]      In 2015, Netlist gave another presentation to Samsung that included "Patent

Portfolio Highlights," in which Netlist specifically identified the '833 and '831 family patents as

"seminal" and "high value." PX0464 at 0043:

## Patent Portfolio Highlights

| Classification | LRDIMM | Alpha Score* | Hybrid | Alpha Score* |
|---|---|---|---|---|
| SEMINAL | | | 8,301,833 (Clock Throttling) | 86 |
| HIGH VALUE | 8,417,870 | 90 | 8,874,831 | 73 |
| PROMISING | | | | |

[FF.I.102]   Even assuming arguendo that Netlist failed to disclose, Samsung has not proven by clear and convincing evidence that it relied on any non-disclosure by Netlist.  To the contrary, because Samsung does not believe disclosure is mandatory and did not even check for disclosed patents, it cannot have relied on whether or not any patent was disclosed.  Further, Samsung cannot claim to have relied on non-disclosure where Netlist disclosed its patents directly in presentations to Samsung.

[FF.I.103]   The Court finds that Samsung also has not proven that, to the extent there was any failure of disclosure, Samsung suffered prejudice.  Samsung introduced no evidence that it would have acted any differently or would have changed its design had there been further disclosure.  To the contrary, the evidence was that (1) Samsung did not believe there was an obligation to disclose patents to JEDEC and did not even check for patents when designing DDR5, and (2) that Samsung was actually aware of Netlist's patents based on presentations by Netlist, but did nothing.  Nor has Samsung proven that it would have acted any differently based on further disclosure.  Given Samsung's view that the patents are not essential, there is no reason Samsung would have changed its design based on further disclosure.

[FF.I.104]     There was no evidence that a commercially acceptable non-infringing design was available. Samsung designated testimony from Hyun-Joong Kim, its 30(b)(6) witness on the subject of DDR5 at JEDEC, theorizing off-module power management was an alternative Samsung could consider. Bench Trial Tr. (Hyun-Joong Kim) at 36:13-16.

> Okay. All right. First of all, as far as 1.1 volt is concerned, that does not have to be on DIMM. It could be achieved on a board through voltage regulator and a switch converter.

[FF.I.105]     However, Mr. Kim admitted that Defendants customers demanded on-module power management. Bench Trial Tr. (Hyun-Joong Kim) at 125:12-126:22:

> Q. Let me first introduce the exhibit. Exhibit Number 13 is JEDEC JC-40 meeting minutes for August 2016, with a beginning Bates number SAM-NET00202367. Mr. Kim, can you please go to page 10?
>
> A. Yes, I found that page.
>
> Q. And it is a presentation by HP Enterprise regarding voltage regulator on DIMM?
>
> A. Yes, that's what that looks like.
>
> Q. And it says, "Moving forward: VR-on-DIMM is key to the DDR5 value proposition." Do you see that?
>
> A. Yes, I see that.
>
> Q. Did Samsung voice any disagreement with this statement?
>
> A. I don't recall exactly whether or not Samsung ex – expressed negative opinion at this particular meeting. But typically when a -- a customer company make this type of presentation, we do not blatantly express a negative opinion; but, rather, at the end of the meeting, we could be discussing it with the customer separately.
>
> Q. Do you recall discussing HP's proposal with them at the end of the meeting?
>
> A. I don't recall whether or not that conversation took place that very day, but, rather, I do recall having had technical discussions on VR-on-DIMM with them continually.
>
> Q. And HP was not convinced by Samsung's position. Correct?
>
> A. Yes. There was a discussion regarding the value proposition, and different technology was discussed, but I believe Samsung went with -- respecting customers' opinion.
>
> Q. Because the customer believed there was value in having voltage regulation on DIMM. Correct?
>
> A. Yes, that's correct.

Q. And the customer believed that whatever concerns Samsung might have had regarding the cons of voltage regulation on DIMM, the benefits outweighed those concerns. Correct?

A. Yes. The customer continuously alleged that there are benefits.

[FF.I.106]    Consistent with this testimony from Mr. Kim, Samsung's 30(b)(6) witness

as to the availability of commercially acceptable alternatives to Netlist '054/'918 patents could not

identify any. Jury Trial Tr. (Kyungsoo Park) at 643:10-17 :

Q. So for topic No. 17, which is the presence or absence of acceptable non-infringing alternatives to the inventions claimed in the Netlist patents-in-suit, what would be your testimony?

A. Okay. First of all, I do not have any opinion in this -- that regard because I can give you testimony on the operation of DDR, PMIC, DDR5 PMIC. However, as to patents, I cannot render any opinion.

[FF.I.107]    Samsung's damages expert Mr. Meyer affirmed the same. Jury Trial Tr.

(Meyer) at 1215:17-20:

Q. And you didn't for the ladies and gentlemen of the jury identify any other alternative that was non-infringing and acceptable for these patents, did you, sir?

A. I did not because I wasn't focused on that.

[FF.I.108]    Samsung's technical expert Mr. McAlexander affirmed the same:

Q. And as to the patents that are accused of DDR5, you didn't speak to any Samsung engineers to determine if there were any alternatives that were available if the Netlist technology was not used. Correct?

A. I did not communicate with any Samsung engineers.

Q. And you did not do an investigation as to whether there was any acceptable non-infringing alternatives. Correct?

A. For this particular matter, no.

Jury Trial Tr. (McAlexander) at 1025:24-1026:6.

[FF.I.109]    At the bench trial, Mr. McAlexander gave the following testimony on

alternatives:

Q. What could Samsung and other JEDEC members have done differently had they been aware of the '918 and '054?

A. Oh, they could have done considerable things differently. Some testimony was already in the hearing today with regard to taking some of these voltage switching circuits and putting them off-module and putting them on the board. One could also take the required buck converter and maybe one or more of those and switching it out with an LDO. These were possibilities that -- any one of which could have been done.

Bench Trial Tr. (McAlexander) at 85:21-86:4.

[FF.I.110]        Mr. Kim confirmed that Mr. McAlexander's first proposal, of shifting power management off module, was rejected by Samsung's customers.  Mr. McAlexander's second strategy, of making changes between buck converters and LDOs, works against Defendants case for prejudice.  As discussed in Section II.A.d & FF.II.56, Samsung's PMICs do not comply with the JEDEC PMIC Specification.  Consistent with this, there is no evidence of any barrier to Samsung choosing to use LDOs instead of buck converters other than commercial acceptability. But as Mr. McAlexander testified to at the jury trial, he is unable to identify any commercially acceptable alternative.

[FF.I.111]        Further, the Court finds that Mr. McAlexander's testimony that a buck converter could be switched out with an LDO contradicts his testimony at the jury trial that a buck converter and LDO are "fundamentally different structures that achieve fundamentally different results." Jury Trial Tr. (McAlexander) at 892:1-19:

Q. So what is your opinion then as to whether a converter circuit is the same as an LDO? A. I have found that the linear regulator, LDO, and the converter circuits are fundamentally different structures.

Q. How so?

A. The structure to -- to actually instantiate an LDO is one in which you have a linear operation through resistors to dissipate heat. The structure that is used for a converter circuit is one in which you use a switching in combination with an inductor to achieve that. So it's an entirely different structure. And in terms of the overall aspects of it, the efficiency on the LDO linear regulator is very low because

you're throwing away energy and heat rather than controlling it, and the converter circuits are a much higher efficiency. So you can use these in different types of environments such as low and high noise, but the thrust of this is they are fundamentally different structures that achieve fundamentally different results.

[FF.I.112]     At the bench trial, Mr. McAlexander showed in a demonstrative depictions

of continuations of DDR5 JEDEC specifications developed in the 2021-2022 timeframe.

However, the only specification that is in evidence that Mr. McAlexander substantively discussed

as relating to the '918/'054 patents is the PMIC Specification, which was approved in June 2020.

JTX0069.  By this point, Samsung had already decided that it would accept its customers' wishes

for on-module power management.  There is no evidence Defendants would have changed its

design had there been further disclosures by Netlist after the approval of JTX0069.  This is

reinforced by the fact that Samsung did not submit any evidence of any attempt to change its design

after the '918 and '054 patents were asserted in this litigation.  The only other JEDEC

specifications relating to DDR5 that are in evidence are for DDR5 DRAM (JTX0049) and DDR5

RDIMM/LRDIMM (DTX0031).  JTX0049 makes no reference to on module power management.

And as discussed in Section II.A.1.d, DTX0031 places no requirements on the internal structure

of the PMIC employed on the module, only on its inputs and outputs.  Mr. McAlexander did not

show a single page from either of these exhibits and explain how they support a conclusion that

the '918 and '054 patents contain "Potentially Essential Patent Claims."

[FF.I.113]     In addition, although the relevant question is Samsung's prejudice, if the

inquiry were to expand to JEDEC, the same conclusion would hold.  Samsung also has not proven

by clear and convincing evidence that JEDEC would have acted differently had there been further

disclosure of the '918 and '054 Patents.  Mr. Gillingham testified that, in nearly 10 years serving

on JEDEC committees, he was unaware of any instance where JEDEC stopped discussion based

on a disclosure of patents for which there was an agreement to RAND.  Bench Trial Tr. (Gillingham) at 141:23-142:1:

> Q. And in your experience, have technical discussions at JEDEC ever stopped when a member discloses a patent that is potentially essential to the technology being discussed?
>
> A. In my experience, I have never witnessed that.

[FF.I.114]        Mr. Gillingham's testimony finds support in the JEDEC manual, which makes only one reference to when a work-around for a patent should be explored: when there is a refusal to RAND.  PX1067-0033 ("JEDEC committees and task groups shall consider reasonable workarounds and technical alternatives (but *are not required to implement such workarounds or alternatives*) within the earlier of: a) balloting, or b) one-hundred twenty (120) calendar days of receiving Notice of Refusal to offer Licenses on RAND Terms.").

[FF.I.115]        Mr. Halbert testified that he had encountered instances of attempts at work-arounds, but he did not testify this occurred in instances in which there was RAND commitment. Bench Trial Tr. (Halbert) at 14:22-15:5.

### B.        Conclusions of Law

#### 1.        Standard and Burden of Proof

[CL.I.1]        To support a finding of equitable estoppel, Samsung must show by clear and convincing evidence that "(1) the patentee, through misleading conduct, le[d] the alleged infringer to reasonably infer that the patentee d[id] not intend to enforce its patent against the alleged infringer; (2) the alleged infringer relie[d] on that conduct; and (3) the alleged infringer w[ould] be materially prejudiced if the patentee [were] allowed to proceed with its claim." *Genband US LLC v. Metaswitch Networks*, 211 F. Supp. 3d 858, 898-99 (E.D. Tex. 2016), *vacated on other grounds*, 861 F.3d 1378 (Fed. Cir. 2017) (citing *Radio Sys. Corp. v. Lalor*, 709 F.3d 1124,

1130 (Fed. Cir. 2013)); *see also Hynix Semiconductor Inc. v. Rambus Inc.*, 645 F.3d 1336, 1348 (Fed. Cir. 2011).

[CL.I.2]        Estoppel requires a showing that "[t]he patentee, through misleading conduct, led the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer."  *Hynix*, 645 F.3d at 1348.  This conduct must be "so inconsistent with an intent to enforce its rights as to induce a reasonable belief that such right has been relinquished.'"  *Id*.; *see also Core Wireless Licensing S.A.R.L. v. Apple, Inc.*, 899 F.3d 1356, 1365 (Fed. Cir. 2018).

[CL.I.3]        Samsung does not assert a defense of implied waiver. However, "the two elements of implied waiver must also be shown to prove equitable estoppel, because without a disclosure duty, Hynix could not 'reasonably infer' that Rambus did not intend to enforce its patents against it, and without a breach of that duty, Rambus's nondisclosure could not be 'misleading conduct.'"  *Hynix,* 645 F.3d at 1348.  Therefore, in addition to proving reliance and material prejudice, Samsung must "show by clear and convincing evidence that . . . (1) the patentee had a duty of disclosure to the standard setting organization, and (2) the patentee breached that duty."  *Id*.

### 2.        Samsung Has Failed to Show a Breach of Duty

[CL.I.4]        To prevail on an affirmative defense of equitable estoppel, the accused infringer must first prove that the patentee breached an affirmative duty of disclosure "because without a disclosure duty, [the patent challenger] could not 'reasonably infer' that [the patent owner] did not intend to enforce its patents against it, and without a breach of that duty, [the patent owner's] nondisclosure could not be 'misleading conduct.'"  *Hynix*, 645 F.3d at 1348; *see also Genband*, 211 F. Supp. 3d at 899 ("[T]here is no equitable estoppel if . . . there was no breach of an existing duty to disclose the patent.").  The requisite "misleading conduct can include 'specific

statements, action, inaction, or silence where there was an obligation to speak.'" *Sycamore IP Holdings LLC v. AT&T Corp.*, 294 F. Supp. 3d 620, 655 (E.D. Tex. 2018) (quoting *Hynix*, 645 F.3d at 1348)).

[CL.I.5]    In *Chrimar Systems, Inc. v. Alcatel-Lucent Enterprise USA Inc.*, 2017 WL 345991, at *3 (E.D. Tex. Jan. 24, 2017), for example, this Court held that a patent owner was not equitably estopped from asserting its patents because it "was under no affirmative duty to disclose the patents-in-suit to the IEEE."  Although the defendant "argu[ed] that because [the patent owner] had sent a letter of assurance on a patent from a different patent family, it had an affirmative obligation to send in a letter on the patents-in-suit," the defendant "provided no evidence of other IEEE members or participants who complied with the IEEE policies in the manner that is consistent with the duty it claims existed." *Id.*  The Court additionally held that "even if [the patent owner] had a duty to disclose, [the defendant] ha[d] not provided evidence of reliance or material prejudice." *Id.*

[CL.I.6]    In *Hynix*, the Federal Circuit held the patentee did not breach its duty of disclosure to JEDEC where, as Netlist did here, "it disclosed to JEDEC its '703 patent, a member of the '898 patent family with the same written description as the patents in suit." *Hynix*, 645 F.3d at 1348.

[CL.I.7]    Samsung has failed to establish by clear and convincing evidence that any individual with a duty of disclosure at Netlist violated any duty of disclosure.

[CL.I.8]    Samsung has failed to establish by clear and convincing evidence that the disclosures that Netlist made to JC-40 were not compliant with the JEDEC Patent Policy.

[CL.I.9]     Samsung has failed to establish by clear and convincing evidence that any individual with a duty of disclosure at Netlist believed that the disclosures that Netlist made to JC-40 were non-compliant.

[CL.I.10]     In *Rambus Inc. v. Infineon Technologies, AG*, 318 F.3d 1081 (Fed. Cir. 2003), the Federal Circuit reviewed a verdict that Rambus had committed fraud by failing to disclose patents to JEDEC.  The Federal Circuit reversed the verdict for lack of substantial evidence, holding that the disclosure duty applied only to actually essential patents.  *Id*. at 1100 ("the relevant disclosure duty hinges on whether the issued or pending claims are needed to practice the standard").  The Federal Circuit held any duty was satisfied by disclosure of a family member patent that contained written description support for the undisclosed patents and applications:

> To the extent Infineon may argue that the duty to disclose also encompasses situations where an application describes (but does not claim) technologies under discussion at JEDEC, this court notes that Rambus disclosed the ′703 patent and thus satisfied such a construction of the duty. With disclosure of the ′703 patent, JEDEC had the written description for all the undisclosed patents and applications. Indeed, all JEDEC members had notice of the written description of all of Rambus's patents before adopting its SDRAM standard.

*Id*.

[CL.I.11]     In *Rambus*, the Federal Circuit further held there was no breach of duty where the defendant failed to prove by clear and convincing evidence that the undisclosed claims were actually essential. 318 F.3d at 1102-03 ("Infineon had to present clear and convincing evidence that there is a reasonable expectation that the standard cannot be practiced without a license under the undisclosed claims"). The Federal Circuit found Infineon failed to prove essentiality where it denied throughout the case that the patents were essential to the standard. *Id*. at 1104 ("Rambus alleges that Infineon admitted at trial that the ′755 and ′575 patents were not related to the SDRAM standard.").

[CL.I.12]     As discussed in Section II.A.1, Samsung has failed to establish by clear and convincing evidence the asserted patents satisfy the definition of Essential Patent Claims or Potentially Essential Patent in the JEDEC Patent Policy.

[CL.I.13]     Samsung's cited cases do not establish any breach of duty under the facts of this case.  In *Barnes & Noble, Inc. v. LSI Corp.*, 849 F. Supp. 2d 925, 939 (N.D. Cal. 2012), the Court merely held that defendants had plausibly alleged equitable estoppel at the pleadings stage, but it did not adjudicate the merits of the defense.  Further, the decision dealt with a different standards-setting organization (the IEEE and ETSI), not disclosures under the JEDEC Patent Policy at issue here. Likewise, *Momenta Pharmaceuticals, Inc. v. Amphastar Pharmaceuticals, Inc.*, 255 F. Supp. 3d 279, 289 (D. Mass 2017) concerned disclosures to a different standards-organization (United States Pharmacopeia), and merely held at summary judgment that there was a genuine dispute of fact on reliance to be resolved.  *Id*. at 289-90.

### 3.     Samsung Has Failed to Prove Substantial Reliance

[CL.I.14]     The second element of equitable estoppel is substantial reliance.  "To show reliance, the alleged infringer must demonstrate that, 'in fact, it substantially relied on the misleading conduct of the patentee in connection with taking some action. . . .  To show reliance, the infringer must have had a relationship or communication with the plaintiff which lulls the infringer into a sense of security in going ahead with building the [infringing product].'" *Genband*, 211 F. Supp. 3d at 899 (citing  *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.* 960 F.2d 1020, 1042-43 (Fed. Cir. 1992) (en banc) ("The accused infringer must show that, in fact, it substantially relied on the misleading conduct of the patentee in connection with taking some action"); *see also Core Wireless*, 899 F.3d at 1367 (suggesting that, in the context of "equitable estoppel," "a third party must interpret the patentee's conduct as constituting a waiver of its rights to enforce the patent").

[CL.I.15]      In *Mars, Inc. v. TruRX LLC*, 2016 WL 4034789, at \*4-5 (E.D. Tex. Mar. 1, 2016)*,* for example, this Court granted summary judgment in the patent owner's favor concerning the defendant's equitable estoppel defense because the patent owner "never communicated with Defendants regarding their alleged infringing activities" and the defendants "had not demonstrated a genuine issue of material fact with regard to the misleading conduct and reliance elements." Additionally, in *Dane Technologies, Inc. v. Gatekeeper Systems, Inc.*, 135 F. Supp. 3d 970, 977 (D. Minn. 2015), the court granted the patent owner's motion for summary judgment concerning equitable estoppel because the defendant presented only "sparse" evidence based on a handful of "bald assertions of [the patent owner's] Chairman" to show that the patent owner "h[ad] abandoned its infringement claim." *Id.* at 997. Based on the defendant's evidence, or lack thereof, "[n]o reasonable juror could [have] conclude[d] that [the patent owner's] conduct was so inconsistent that it was reasonable to believe it had relinquished its enforcement rights." *Id.* at 998.

[CL.I.16]      Here, there is no clear and convincing evidence Samsung substantially relied on any alleged non-disclosure by Netlist or made any decisions based on its claimed lack of disclosure. To the contrary, as discussed in Section I.A.3, the evidence was that Samsung did not believe there was a disclosure obligation to JEDEC, did not check for disclosed patents before designing its DDR5 products, and chose to develop on-module power management because its customers desired the feature. If Samsung did not check for patents or believe disclosure was required, it could not have relied on any alleged non-disclosure in designing its products.

[CL.I.17]      As discussed in FF.I.98, there was no testimony by any Samsung witness or expert that Samsung interpreted Netlist's silence as a waiver, or subjectively believed Netlist would not enforce the '918 and '054 Patents. Nor was there any testimony that Samsung made design decisions for DDR5 based on patents that had or had not been disclosed, or took any action

based on the fact Netlist had not disclosed the '918 and '054 patents to JEDEC.  In fact the testimony was the opposite—that Samsung did not even check the JEDEC patent disclosures or rely on them in designing its products.  The Court therefore concludes that Samsung has not proven reliance as a matter of law.

### 4.      Samsung Has Not Proven Material Prejudice

[CL.I.18]      Material prejudice "may be economic or evidentiary."  *Genband*, 211 F. Supp. 3d at 899.  "Economic prejudice 'may be shown by a change of economic position flowing from actions taken or not taken by the patentee,'" *id.* (quoting *Aspex Eyewear, Inc. v. Clariti Eyewear, Inc.*, 605 F.3d 1305, 1312-13 (Fed. Cir. 2010)), and evidentiary prejudice "may arise by reason of a defendant's inability to present a full and fair defense on the merits," *id.* (quoting *Aukerman*, 960 F.2d at 1033 (citations omitted)).  Economic prejudice does not result merely because a patent owner "finally br[ings] suit" several years after the "plaintiff first became aware of defendants' allegedly infringing" products.  *Meyers v. Asics Corp.*, 974 F.2d 1304, 1306 (Fed. Cir. 1992) (reversing the district court's determination that equitable estoppel and laches barred the plaintiff's claims).

[CL.I.19]      In *Meyers*, for example, the defendants suffered no "economic prejudice" even though the plaintiff waited to file suit until after they had released several new allegedly-infringing shoe designs because "the evidence show[ed] that none of the defendants w[ere] concerned that its products might infringe Meyers' patents, and d[id] not show that any of the defendants ***would have acted differently*** had Meyers sued earlier."  *Id.* at 1307-08 (emphasis added).  Even though "[t]here [was] no dispute that defendants ha[d] suffered an economic detriment," they failed to provide evidence that they suffered "prejudice result[ing] from Meyers' delay."  *Id.* at 1308.  Moreover, the defendants could not prove that they suffered "evidentiary prejudice" because "none of the defendants state[d] exactly what particular prejudice it suffered

from" and mere "[c]onclusory statements that there are missing witnesses, that witnesses' memories have lessened, and that there is missing document evidence, are not sufficient." *Id.*

[CL.I.20]    Here, as discussed in Section I.A.3, Samsung failed to prove any prejudice. Among other things, Samsung has not specifically proven anything it would have done differently had there been additional disclosure.

[CL.I.21]    Further, Samsung has not identified any evidentiary prejudice.

[CL.I.22]    Samsung's citation to *Lucas Aero., Ltd. v. Unison Indus., L.P.*, 899 F. Supp. 1268, 1294 (D. Del. 1995) does not support its argument for prejudice.  There, the Court found no error in granting judgment as a matter of law that there was no equitable estoppel, because patentee had not breached any duty and there was no evidence of reliance. *Stambler v. Diebold, Inc.*, 1988 WL 95479, at *6 (E.D.N.Y. Sep. 2, 1988) is inapposite.  There, the patentee contacted defendant only once when his patent issued, then remained silent for ten years before bringing suit.  The Court found "plaintiff's silence could reasonably be interpreted as an indication that plaintiff had abandoned its patent claims." *Id*. at *6.  There was no such silence in this case—Netlist informed both JEDEC and Samsung of the '918 and '054 patent family and brought suit against Samsung shortly after the patents issued.

### 5.    The Balance of Equity Does Not Favor a Finding of Unenforceability

[CL.I.23]    Because estoppel is an equitable defense, the Court also needs to weigh the equities.  *Core Wireless*, 899 F.3d at 1368 ("an equitable doctrine 'hinges on basic fairness'"). "[T]he task of applying an equitable defense is [also] committed to the district court's discretion," meaning it can decline to apply the defense even if there is estoppel. *Id*. at 1369.  In addition to failing to establish all (or any) elements of the estoppel defense, the following additional factors disfavor holding the patents-in-suit unenforceable and the Court declines to apply estoppel as a matter of equity.

[CL.I.24]     First, Samsung did not suffer prejudice.  *See* Section I.A.3.

[CL.I.25]     Second, Samsung itself does not believe there is a mandatory duty of disclosure to JEDEC, treating disclosure only as "recommended."  Bench Trial Tr. (Kim) at 124:23-125:6.  It would be unfair to hold Netlist to a duty of disclosure to JEDEC that Samsung itself does not recognize.

[CL.I.26]     Third, Netlist did make disclosures to JC-40 of the patent family, and reasonably could have believed this disclosure satisfied its obligations.

## II.     UNCLEAN HANDS

### A.     Findings of Fact

#### 1.     Samsung Has Not Proven by Clear and Convincing Evidence that the Asserted Claims of the '339, '918, or '054 Patent Are Essential Patent Claims

[FF.II.1]     The JEDEC Patent Policy sets out the extent to which a JEDEC member has an obligation to offer to license its patents on RAND terms.  Specifically, the JEDEC Patent Policy states that only "Essential Patent Claims" are subject to RAND obligations:

**8.2.4 RAND Patent Licensing Commitment**

Subject to the terms and conditions of section 8.2.4, each Committee Member, as a condition of Participation, agrees to offer to license on RAND terms, to all Potential Licensees, such Committee Member's Essential Patent Claims for the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard issued during the period of membership in that committee. The licensing commitment does not apply to Essential Patents of a Committee Member where notice of a Refusal to License has been given by the Committee Member in accordance with 8.2.3.1.

DTX-02 at 34.

[FF.II.2]     The JEDEC Patent Policy defines "Essential Patent Claims:"

**Essential Patent Claims:** Those Patent claims the use of which would necessarily be infringed by the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard.

> NOTE Essential Patent Claims do not include Patent claims covering aspects that are not required to comply with a JEDEC Standard, or are required only for compliance with sections that are marked "example," ''non-normative," or otherwise indicated as not being required for compliance, or related to underlying enabling technologies or manufacturing techniques not specified in the standard.

*Id.* at 31.

[FF.II.3]      A patent claim is therefore essential only if it is necessarily infringed in order to be in compliance with a required portion of a JEDEC standard.

[FF.II.4]      The JEDEC Patent Policy also recognizes that not everything identified in a JEDEC standard is required, and thus draws a distinction between required portions on the one hand, and sections indicated as not being required for compliance on the other hand.

[FF.II.5]      At the bench trial, Samsung's JEDEC expert Mr. Halbert testified that merely because an infringing product is standard compliant does not mean that the patent claim is necessarily essential.  This is because JEDEC allows for product differentiation between suppliers, and there are different ways of implementing the standard:

> Q. This is paragraph 41 for your report. You wrote in your report, "Because standards are drafted somewhat broadly to allow individuals and companies in the industry to develop their own standard compliant solutions, i.e., to allow for product differentiation between suppliers, a patent may be infringed by some implementations of the standard and not others. In that case, the patent would not be a potentially essential patent as defined by JEDEC." Did you write that in your report?
>
> A. I did.

Bench Trial Tr. (Halbert) at 22:15-24.

[FF.II.6]      Netlist's JEDEC expert Mr. Gillingham concurred with Mr. Halbert, and testified that "An essential patent claim are those claims which would necessarily be infringed by a product that is compliant with required portions of an approved JEDEC standard. So it would not include optional portions of a standard or examples or reference designs, for example." Bench Trial Tr. (Gillingham) at 136:22-137:3.

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[FF.II.7]       Netlist's complaint and its infringement contentions in this action accused Samsung memory modules that Samsung contended are compliant with JEDEC standards:

> BY MR. CORDELL And here Netlist is accusing certain Samsung products of infringement. Are you aware of that?
>
> A. Yes, I'm aware of that.
>
> Q. And here it says, "As further example, the accused instrumentalities include, without limitation, any Samsung DDR5 LRDIMM and DDR5 RDIMM products made, sold, used, and/or imported into the United States by Samsung that are JEDEC-standard compliant memory modules." Do you see that?
>
> A. I do see that.

Bench Trial Tr. (Milton) at 48:21-49:5.

[FF.II.8]       Samsung did not identify any portions of the complaint or contentions that asserted that Samsung's infringement was based solely on the "required" portions of any JEDEC standard or that used the term "essential."

> a.       Samsung's Corporate Representative Admitted that the Tri-State Buffers Required by the '339 Patent Claims Are Not Necessary for Compliance with the Required Portions of JEDEC Standards
>
> (1)       *Samsung Has Not Carried Its Burden of Establishing that the Tristate Buffer Limitation in the '339 Patent Claims Is Required in the JEDEC DDR4 Buffer Specification*

[FF.II.9]       All asserted claims of the '339 patent require the presence of a tri-state buffer. *See, e.g.*, '339 Pat. Cl. 1: "wherein the byte-wise data path includes first tristate buffers, and the logic in response to the module control signals is configured to enable the first tri-state buffers to drive the respective byte-wise section of the N-bit wide write data to the respective module data lines during the first time period."

[FF.II.10]       Netlist did not assert infringement based on the doctrine of equivalents with respect to the tri-state buffer limitation.

[FF.II.11]        Netlist's infringement expert Dr. Mangione-Smith did not rely on any standards documents to prove infringement of the tri-state buffer limitation.  Instead, he relied on testimony of the corporate designee of Renesas, who manufactures the buffers used in the accused Samsung DDR4 LRDIMM products in combination with a Renesas datasheet (JTX0020).  Below is the testimony Dr. Mangione-Smith gave and the demonstratives shown during that testimony.

> Q. Now, let's look at how those paths precisely are turned on and off. What is the triangle that you've made purple there in the data path?
>
> A. So it's labeled TX. That's for transmitter. And that figure is used to represent what's called a tri-state buffer. In electronics, a tri-state buffer is just a buffer that is like a door. It's either opened or closed. The path is turned on or it's turned off.



**'339 Patent, Claim 1**

G.  wherein the byte-wise data path is enabled for a first time period in accordance with a latency parameter to actively drive a respective byte-wise section of the N-bit wide write data associated with the memory operation from the first side to the second side during the first time period; **and wherein the byte-wise data path includes first tristate buffers**, and the logic in response to the module control signals is configured to enable the first tristate buffers to drive the respective byte-wise section of the N-bit wide write data to the respective module data lines during the first time period.

> Q. And how do the transaction logic and the tri-state buffer drive the data to the BCOMs?
>
> A. Well, they do that by providing the information that was received on the first side up to the second side.
>
> Q. And have you seen testimony about that?
>
> A. I have, yeah.

Jury Trial Tr. (Mangione-Smith) at 397:6-22; *see also* Jury Trial Tr. (Davey) at 663:9-14 ████

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████████████████████████████████████████████████████████████████████).

[FF.II.12]     At the bench trial, Mr. McAlexander showed the following portion of the

JEDEC specification for buffers in DDR4 LRDIMM (JTX-0057):



Figure 15 — Logic Diagram
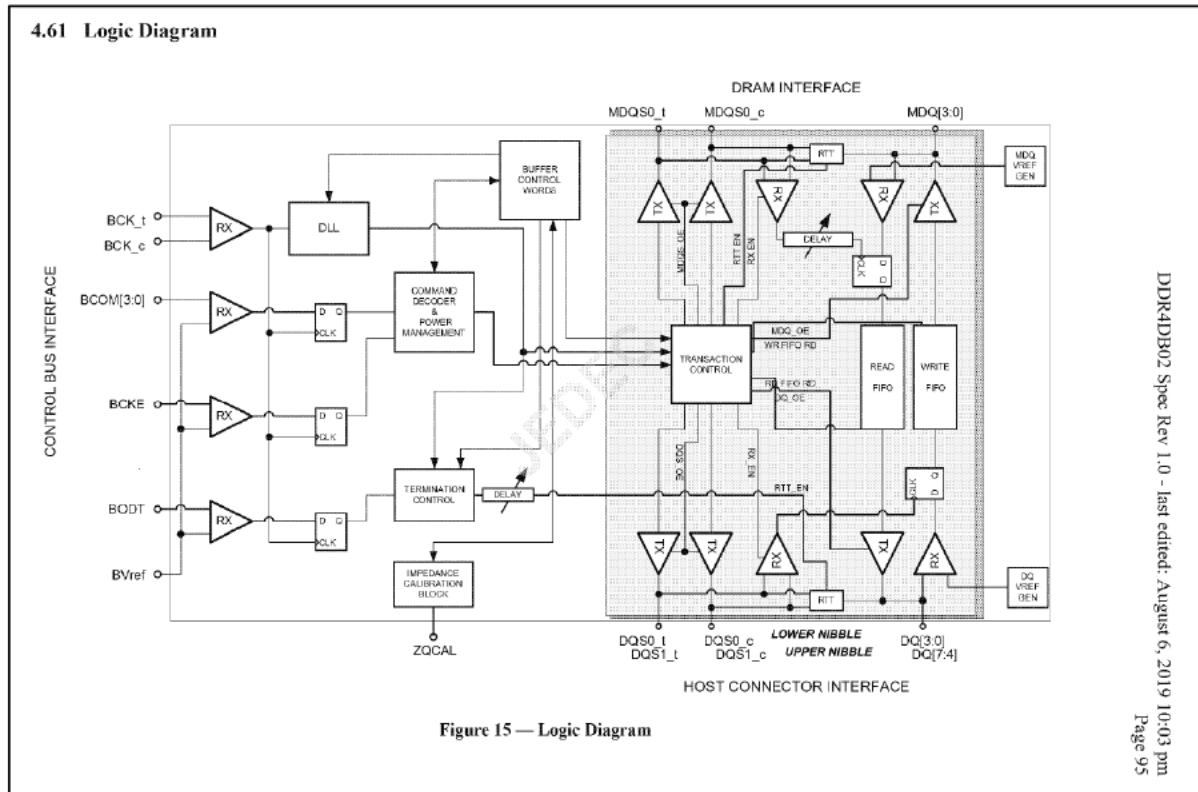
Bench Trial Tr. (McAlexander) at 94:11-24 ("MR. McKEON: Let's pull up, if we can, JTX 57.

Q. (BY MR. McKEON) And what are we looking at here? A. JDS82, which is a DDR4 data buffer

definition, and this is the JEDEC standard. Q. And looking at page 111, what does this document

tell you -- well, what do we show here? A. What we show here in the JEDEC standard is the

JEDEC standard is the logic diagram. . . .)

[FF.II.13]     Mr. McAlexander represented to the Court that JTX0057 (the JEDEC

DDR4 Buffer Specification) was relied on by Dr. Mangione-Smith.   Bench Trial Tr.

(McAlexander) at 94:22-24 ("Q. Now, was this document relied on to prove infringement in the jury trial?  A. Yes.").  As noted in preceding paragraphs, this is incorrect.  Dr. Mangione-Smith relied on JTX0020, which is a Renesas data sheet, as well as the testimony of a Renesas witness describing how the figure in the data sheet is actually implemented by Renesas.  There are clear commonalities in the figure in the data sheet and the figure in the JEDEC specification. But Mr. McAlexander did not testify that the way this figure is implemented in the Renesas data sheet is in the required portions of the specification.

[FF.II.14]    Exploring all the differences and similarities between JTX0020 (the Renesas data sheet) and JTX0057 (the JEDEC specification) is moot.  This is because Samsung has confirmed that the JTX0057 specification does not require a tri-state buffer.  Samsung designated Seung-Mo Jung as its corporate representative on "technical topics related to DDR4 LRDIMMs."  Bench Trial Tr. (Seung-Mo Jung) at 128:18-20 ("Q. You've been designated to speak on behalf of Samsung as to technical topics relating to DDR4 LRDIMMs?  A. That's correct.").

[FF.II.15]    Mr. Jung was shown the JEDEC specification for the DDR4 LRDIMM buffers.  Mr. Jung testified that when Samsung identifies its products as compliant with JEDEC standards, it is addressing compliance with operations.  *See* Bench Trial Tr. (Seung-Mo Jung) at 129:13 ("We test to test the operations that are defined by JEDEC.").

[FF.II.16]    Mr. Jung further testified that the JEDEC standards do not require the use of tri-state buffers:

Q. And you understand that JEDEC specifies a tri-state buffer for the DBs?

A. Let me check. If you could tell me where in JEDEC it is specified? I'm going to check that part.

Q. Let's go to the DDR4 data buffer standard logic diagram 4.6.1. -

A. Okay. Please go ahead.

Q. **The DB standard JEDEC standard specifies the use of tri-state buffers**. Those are the TX and RX triangles on the right-hand side of this document.

A. **To the extent of my knowledge, it doesn't specify here that these are related to tri-state buffers**.

Bench Trial Tr. (Seung-Mo Jung) at 129:14-25 (emphasis added).

[FF.II.17]      Samsung's expert Mr. McAlexander confirmed that Samsung's corporate representative testified that the DDR4 buffer specifications do not require the use of a tri-state buffer.   Bench Trial Tr. (McAlexander) at 101:1-9 ("Q. And Mr. Jung testifies that JEDEC standard doesn't specify tri-state buffers. Correct? A. That is what Mr. Jung stated, yes. Q. And Mr. Jung was Samsung's corporate representative under oath. Correct? A. I can't deny that. He was. Q. And you understand the claims of the '339 strictly require the use of a tri-state buffer. Correct? A. Yes, they do.").

[FF.II.18]      Samsung's expert Mr. McAlexander also testified that he did not identify the presence of a tri-state buffer as required by the JEDEC specification.

Q. And you didn't identify the presence of tri-state buffers as required in the JEDEC standard. Correct?

A. I did not refer to the JEDEC standard.

Bench Trial Tr. (McAlexander) at 100:14-16.

Q. And did you identify any portion of the JEDEC standard that recites the presence or uses the phrase 'tri-state buffers'?

A. I don't believe so.

Bench Trial Tr. (McAlexander) at 100:22-25.

Q. And in your report do you identify JTX 057 as requiring tri-state buffers?

A. I don't believe I did so.

Bench Trial Tr. (McAlexander) at 110:15-17.

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[FF.II.19]      Mr. McAlexander testified that the '339 patent is not standard essential.  *See*

Bench Trial Tr. (McAlexander) at 93:20-22 ("Q. Now, as to the '339 Patent, is it your opinion that

the patent is standard-essential?  A. No, it is not.").  He did not testify that his report opined that if

Netlist's infringement positions were accepted, the patent is standard essential.

[FF.II.20]      Notably, this difference between the patent and the evidence used to prove

infringement, on the one hand, and the JEDEC DDR4 Buffer Specification, on the other hand,

exists even after the Court assumes the jury accepted all of Netlist's infringement contentions.

> (2)   *Samsung Has Not Carried Its Burden of Establishing that the "Drive" Limitation in the '339 Patent Is Necessary for a Required Portion of the JEDEC DDR4 Buffer Specification*

[FF.II.21]      All of the asserted claims of the '339 patent recite a "drive" limitation.  A

representative example is claim 1, which recites "actively drive a respective byte-wise section of

the N-bit wide write data associated with the memory operation from the first side to the second

side during the first time period."

[FF.II.22]      Netlist proposed a construction of the term "drive" which the Court rejected

in its claim construction order dated December 14, 2022. Dkt. 114.  The Court construed the term

to mean "enabling only one of the data paths while the other possible paths are disabled."  *Id.* at

10.

[FF.II.23]      At the jury trial, Dr. Mangione-Smith established infringement of this

limitation by pointing ██████████████████████████████████████████████

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████████      Jury Trial Tr. (Mangione-Smith) at 375:2-376:13:

██████████████████████████████████████

█████████████████████████

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. . . .

## '339 Patent, Claim 1

G. wherein the byte-wise data path is enabled for a first time period in accordance with a latency parameter **to actively drive a respective byte-wise section of the N-bit wide write data associated with the memory operation from the first side to the second side during the first time period**; and wherein the byte-wise data path includes first tristate buffers, and the logic in response to the module control signals is configured to enable the first tristate buffers to drive the respective byte-wise section of the N-bit wide write data to the respective module data lines during the first time period.

[FF.II.24]

[FF.II.25]     Mr. McAlexander testified that the JEDEC specifications for the DDR4 LRDIMM buffer was used to prove infringement at trial as to the drive limitation based on the upper and lower nibble:

> Q. And looking at page 111, what does this document tell you -- well, what do we show here?
>
> A. What we show here in the JEDEC standard is the JEDEC standard is the logic diagram which shows the nibble mode -- lower and upper per nibble mode passage in the right direction from one side to the other, and this is a part of and implemented in the JEDEC standard.
>
> Q. Now, was this document relied on to prove infringement in the jury trial?
>
> A. Yes.

Bench Trial Tr. (McAlexander) at 94:15-24

[FF.II.26]     This statement is not accurate.  At trial, Netlist's infringement expert Dr. Mangione-Smith did not rely on the standards document.  He relied on a Renesas data sheet (JTX0020) in combination with testimony of Mr. Davey regarding the specific implementation used by Renesas.  There are clear commonalities in the figure in the data sheet and the figure in the JEDEC specification. But Mr. McAlexander did not testify that the way this figure is implemented in the Renesas data sheet is in the required portions of the JEDEC specification.

[FF.II.27]     The question of the differences and similarities between JTX0020 (the Renesas data sheet) and JTX0057 (the JEDEC specification) is moot.  This is because Mr. McAlexander did not provide any analysis of where the JEDEC specification requires ████████

████████████████████████████████████████████, and upon which Dr. Mangione-

Smith relied.  Jury Trial Tr. (Davey) at 663:20-665:24.  In particular, Mr. Davey testified regarding

control based on the MDQ signal.  *Id*.  In the bench trial, Mr. Davey testified that the response to

the MDQ signal (MDQS) was an implementation decision specific to Renesas.  Bench Trial Tr.

(Davey) at 41:17-42:1 ("A. Are you asking about different implementations to accomplish the

requirements by the spec?  Q. Yes.  A. Okay. We did evaluate different proposals, and we looked

at which one would be the most cost effective and viable for our -- to reach the solution dictated

by the JEDEC spec. Q. And why did you arrive at this particular solution for the MDQS read

delay? A. It was deemed that this would be the most viable solution in terms of cost area, silicon

area, and power.").

[FF.II.28]       Mr. McAlexander did not identify where in the JEDEC specification the

functionality Mr. Davey testified existed in the Renesas buffers, and Dr. Mangione-Smith relied

on, was disclosed, let alone *required*.

[FF.II.29]       Mr. McAlexander admitted that he did not analyze at any point in time what

were the required versus not required portions of the DDR4 LRDIMM buffer JEDEC specification.

Bench Trial Tr. (McAlexander) at 99:11-17 ("Q. Did you identify whether those portions of the

specification that you showed in your direct examination were required or non-normative, or just

examples? Did you actually do that analysis?  A. Well, with regard to these particular words about

example or non-normative, what I did do was specifically take -- I did not specifically address

this.").

[FF.II.30]       At the bench trial, Samsung called Renesas' representative Mr. Davey by

deposition.  Mr. Davey testified that the buffers that Renesas designs are "compliant" with JEDEC

standards.   Bench Trial Tr. (Davey) at 42:13-15 ("Q. And that's compliant with the JEDEC standards for the DDR4 data buffers. Right?  A. Correct.").

[FF.II.31]      As discussed above, Mr. Halbert testified that a product can comply with a JEDEC standard, and yet can use a particular implementation that infringes a patent claim, without that patent claim being essential: "a patent may be infringed by some implementations of the standard and not others. In that case, the patent would not be a potentially essential patent as defined by JEDEC."  Bench Trial Tr. (Halbert) at 22:15-24.

[FF.II.32]      Consistent with this testimony, Mr. Davey testified that Renesas has flexibility when making implementation decisions.  Bench Trial Tr. (Davey) at 41:14-22 ("Q. So can you tell me a little bit about the alternatives that Renesas considered with respect to the operation of its data buffers?  A. Are you asking about different implementations to accomplish the requirements by the spec?  Q. Yes.  A. Okay. We did evaluate different proposals, and we looked at which one would be the most cost effective and viable for our -- to reach the solution dictated by the JEDEC spec.").

[FF.II.33]      Notably, this difference between the patent and the evidence used to prove infringement on one hand, and the JEDEC DDR4 Buffer Specification on the other, exists even after the Court assumes the jury accepted all of Netlist's infringement contentions.

          b.     <u>Netlist Made Clear During Fact Discovery That Netlist as a Company Had Not Done a Formal Essentiality Analysis and that this Requires Expert Analysis</u>

[FF.II.34]      Netlist took the position in a settlement communication with Samsung that the '339 patent was one of 37 patents it treated as essential in the letter and which it was prepared to license on FRAND terms.  *See* DTX-32 at 2, 7-9:

[FF.II.35]      Samsung in response disputed that any of Netlist's patents were essential, and specifically identified those patents Netlist accused Samsung of infringing as ones it was not accepting as essential.  PX1821 at 1-3:
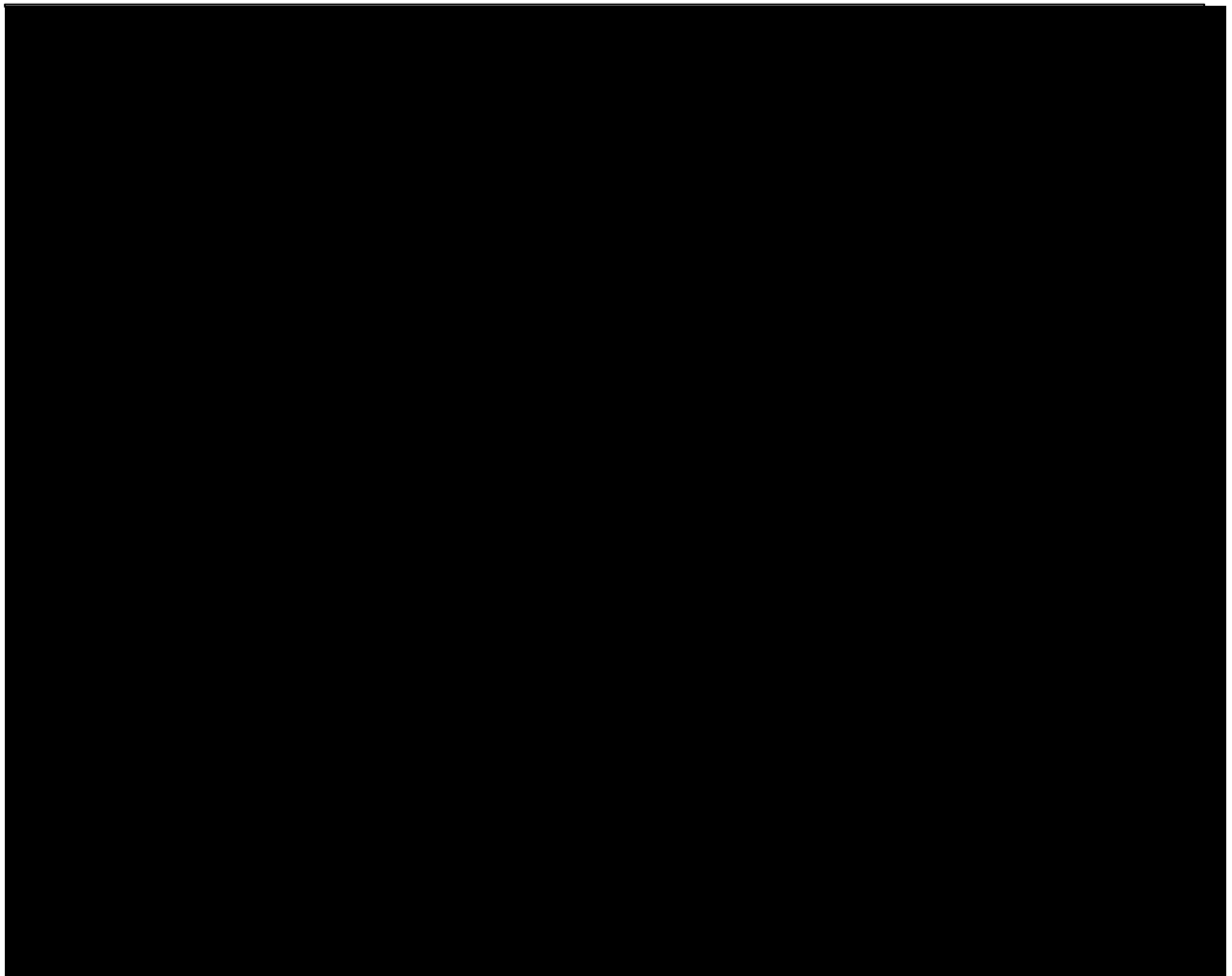
[FF.II.36]    Netlist's corporate representative testified at the bench trial that Netlist does not perform a formal analysis before disclosing its patents as essential in licensing communications.   Bench Trial Tr. (Milton) at 67:16-22 ("Q. Does Netlist do an element-by-element analysis in which it compares its claims to the standard before -- A. No -- I'm sorry. Q. -- before disclosing its patents as essential? A. No, we don't. You know, I did talk to our head of licensing Eric Lucas, who is our VP of licensing, and he confirmed that for me--we do not do that.").

[FF.II.37]    Netlist's CEO, Chuck Hong, presented Samsung with a set of notes at his deposition during fact discovery, which is consistent with the above testimony.   Dkt. 514-14 (PX1822) (demonstrative at bench trial) at 2 (highlighting in original, red emphasis added):



To the extent Netlist contends that any of the asserted claims of the Asserted Patents are essential to a standard, the basis for Netlist's proposed FRAND royalty calculation.

Expert analysis required for SEP determination. Netlist has not performed a formal SEP analysis LRDIMM, DDR5 and HBM cannot be made commercially viable without Netlist technology

*See also* Bench Trial Tr. (Milton) at 69:11-70:3:

Q. (BY MR. SHEASBY) Do you recognize this document, Mr. Milton?

A. Yes, sir.

Q. Who was this document presented to?

A. It was presented to Samsung.

Q. And it says, "To the extent Netlist contends that any of the asserted claims of the asserted patents are essential to a standard, the basis for Netlist's proposed FRAND royalty calculation. Expert analysis required for SEP determination.  Netlist has not performed a formal SEP analysis [verbatim]."  Did I read that correctly?

[…]

THE COURT: Did he read it correctly, Mr. Milton?

THE WITNESS: He did, Your Honor.

*See also* Dkt. 521 at 7-8 (proffer discussing the testimony Mr. Hong provided regarding these notes at deposition).

[FF.II.38]      Netlist's Vice President of Engineering, Scott Milton, was also deposed in this case during fact discovery.  He testified at deposition that he believed the '339, '918, and '054 patents were essential in the "ordinary" sense of the word.  At this deposition he made clear that he had not performed a technical analysis comparing the claims to the required portions of the JEDEC standards:

Q. (BY MR. SHEASBY) Mr. Cordell showed you part of your deposition and he didn't show you all of it, and I wanted to show you another portion of it.  So this is the page before he showed where the question is, "Is the '918 Patent essential to any standard?"

Answer: "So how -- how is the word 'essential' being defined?"

Question: "So how do you define 'essential' here?

"Well, I guess I'm asking is it a legal term or its ordinary use?"

Question: "Okay. It's ordinary use. Okay. Today I'm not asking you any legal questions. I have no interest in getting your input on legal issues."

Q. (BY MR. SHEASBY) Question: "So when you say 'essential to DDR5 products', do you mean essential to DDR5 standard as set out by JEDEC?"

Answer: "Yeah. I don't know that I can -- if I can comment on the standard because I'm not -- I'm not designated on JEDEC."

Bench Trial Tr. (Milton) at 65:4-16; 67:1-6.

[FF.II.39]     Mr. Milton testified consistently at the bench trial.  Bench Trial Tr. (Milton) at 67:9-11 ("Q. Have you ever reviewed the exact definition of 'essentiality' set out by JEDEC? A. I have not.").

> c.     Both Parties' Final Supplemental Interrogatory Responses Before the Close of Fact Discovery Agreed that the Asserted Patents Were Not Essential

[FF.II.40]     Netlist's First Supplemental Interrogatory Response regarding the issue of essentiality, served on November 21, 2022, identified the '339, '918, and '054 patents as essential to JEDEC standards.  Bench Trial Tr. at 43:8-44:9.  Defendants do not identify any earlier assertion of essentiality as to the required portions of JEDEC specification.  Netlist's Second Supplemental Interrogatory Responses were served less than a month later in December, and clarified that the essentiality was commercial essentiality, not the legal definition of essential under JEDEC.  Netlist explained in its interrogatory response that this change was based on an examination of Samsung's witnesses:

> Based on subsequent confidential deposition testimony of Samsung witnesses, the necessity of using Netlist patents is a commercial necessity for the sale of Samsung's accused infringing products. As to whether there's a theoretical way of implementing the standards without using Netlist patents, that is irrelevant in this case because the objective evidence demonstrates that Samsung infringes.

> Furthermore, Samsung does not claim that the patents are necessary for practicing the standard, which means its infringement involuntary and, thus, its culpability cemented [verbatim].

Bench Trial Tr. at 44:14-24.

[FF.II.41]      Samsung did not attempt to use any of these interrogatory responses in front

of the jury, either by reading them into the record, by cross-examining Netlist's witnesses on them,

or by having their expert Mr. McAlexander discuss them.

[FF.II.42]      In an interrogatory response dated July 11, 2022, Samsung initially took no

position on the essentiality of Netlist's patents, instead simply stating that Netlist had failed to

prove essentiality.  Bench Trial Tr. at 132:14-25 ("Netlist has not shown that any of the asserted

claims are essential to any JEDEC standard identified in Netlist's infringement contentions.

Indeed, although Netlist has declared other patents essential to various JEDEC standards, Samsung

is not aware of Netlist ever declaring any of the asserted patents in this case essential to a JEDEC

standard.").

[FF.II.43]      On November 10, 2022, Samsung supplemented its response to

affirmatively contend the patents were not essential.  Bench Trial Tr. at 133:1-6 ("Netlist has not

shown that any of the asserted claims are essential to any JEDEC standard identified in Netlist's

infringement contentions. Samsung disagrees that any claim is essential to any JEDEC standard,

and incorporates its response to Interrogatory No. 1.").

[FF.II.44]      Both Netlist's position and Samsung's position in their final supplemental

interrogatory responses on this issue during fact discovery are consistent with the testimony of

Samsung's corporate representative Mr. Jung and Mr. Davey.

[FF.II.45]      Federal Rule of Civil Procedure 26(e) sets out the obligation for

supplementation that must occur when a party learns that information in an interrogatory is

incomplete or incorrect:

> A party who has made a disclosure under Rule 26(a) —or who has responded to an
> interrogatory, request for production, or request for admission—must supplement
> or correct its disclosure or response:

(A) in a timely manner if the party learns that in some material respect the disclosure or response is incomplete or incorrect, and if the additional or corrective information has not otherwise been made known to the other parties during the discovery process or in writing;

[FF.II.46]    On November 10, 2022, Samsung supplemented its interrogatory responses to contend that the asserted patents are not essential.  Approximately a month later, Netlist supplemented its interrogatory responses to agree.  At the bench trial, Samsung did not identify any factual basis as to why this month-long gap represented an untimely supplementation. Samsung's experts at the bench trial did not dispute that the testimony of Messrs. Jung and Davey establishes that the asserted claims do not satisfy the definition of Essential Patent Claims.  If Samsung would have attempted to litigate this issue, Dr. Mangione-Smith could have cited this testimony.  And Samsung's expert Mr. McAlexander would not have disputed this testimony, just as he did not dispute it at the bench trial.

[FF.II.47]    This Court does not need to reach the question of whether the asserted claims of the '339 patent actually satisfy the definition of Essential Patent Claims, as this would be an advisory verdict.

[FF.II.48]    The Court finds that Defendants did not carry its burden of proof of showing by clear and convincing evidence that the asserted claims of the '339 patent satisfy the definition of Essential Patent Claims.

> d.    Samsung's Corporate Representative Testified that the Structures Netlist Relied on to Establish Infringement of the '918 and '054 Patents Are Not Required By JEDEC

[FF.II.49]    The asserted claims of the '918 and '054 patents each require a number of converters with specific features to produce four separate voltages.  Claim 16 of the '918 patent is exemplary for this purpose, reciting the presence of four converters producing four distinct voltages.  *See* '918 Pat., Cl. 16 ("first, second, and third buck converted configured to receive a

pre-regulated input voltage and to produce first, second and third regulation voltages, respectively;

a converter circuit configured to reduce the pre-regulated input voltage to provide a fourth

regulated voltage, wherein the first, second, third and fourth regulated voltages have first, second,

third, and fourth voltage amplitudes, respectively.").

[FF.II.50]     At the bench trial, Mr. McAlexander presented a JEDEC specification for

PMICs and identified the following figure from this document as both required to comply with

JEDEC standards and implemented by Samsung in its accused DDR5 DIMM module.  JTX0069

at 0013 (the "PMIC Specification") (emphasis added).

## 2.1.1  Common Features summary

Table 1 — PMIC Device Type Summary

| Device Type | SWA | SWB | SWC | SWD | Unit |
|---|---|---|---|---|---|
| PMIC5000 - Current Capability per Phase | 5 | 5 | 5 | 5 | A |
| PMIC5010 - Current Capability per Phase | 3 | 3 | 3 | 3 | A |

- VIN_Bulk input supply range: 4.25 V to 15.0 V
- VIN_Mgmt input supply range: 3.0 V to 3.6 V
- Four step down switching regulators: SWA, SWB, SWC & SWD
- Programmable dual phase and single phase regulator for SWA and SWB
- 3 LDO regulators: VBias, VOUT_1.8V, VOUT_1.0V

See Bench Trial Tr. (McAlexander) at 77:21-78:7 ("(MR. McKeon) And looking at this page, what

does this tell you about whether the LDO is required by the standard?  MR. McKEON: And if we

can go down. There you go.  THE WITNESS: Well, in Section 2.1.1 of the standard, it gives a

table that specifically summarizes the switches, the PMIC device summary, and then in the third

bullet down it specifies the switching regulators, and then lastly in the last line it specifically recites

LDO regulators.  Q. (BY MR. McKEON) Does that indicate whether it's required by the standard?

A. Yes, it's required by the standard.").

[FF.II.51]      Mr. McAlexander emphasized, for example, that to make JEDEC compliant

DDR5 memory modules, the product accused of infringement in this case, *required* the use of the

three LDO regulators referenced above.  Bench Trial Tr. (McAlexander) at 101:14-19 ("Q. And

you referred to the three LDO regulators—Vbias VOUT_1.8v, and VOUT_1.0v. Correct?  A. Yes,

I did.  Q. And you told the Court under oath those were required.  Correct?  A. By the JEDEC

standard, yes.").

[FF.II.52]      Although Mr. McAlexander repeatedly made statements regarding what he

believed was "required" by JEDEC for DDR5 modules, he testified on cross-examination that he

had not analyzed the differences between what portions of the specification were required as

opposed to optional, or as Mr. Gillingham described it, "reference designs," *see* Bench Trial Tr.

(Gillingham) at 136:24-137:3.  Mr. McAlexander testified:

> Q. Did you identify whether those portions of the specification that you showed in
> your direct examination were required or non-normative, or just examples? Did you
> actually do that analysis?
>
> A. Well, with regard to these particular words about example or non-normative,
> what I did do was specifically take -- I did not specifically address this.

Bench Trial Tr. (McAlexander) at 99:11-17.

[FF.II.53]      Netlist presented the testimony of Mr. Kyungsoo Park, the technical leader

for DDR5 PMICs at Samsung.  Bench Trial Tr. (Kyungsoo Park) at 130:13-19 ("Q. What is your

position at Samsung LSI?  A. TL. Q. What does TL stand for? A. Technical leader.  Q. You said

you are a technical leader. In which project or which group are you the technical leader for? A. I

am in the group that works on PMIC for the DDR5.").

[FF.II.54]      Mr. Park testified that he was the person most knowledgeable on DDR5

PMICs at Samsung.  Jury Trial Tr. (Kyungsoo Park) at 641:2-7 ("Q. So the PMICs at issue here

are to be used for DDR5 DIMMs.  Is that correct?  A. Yes, that's correct.  Q. Okay.  And you are

the person most knowledgeable about PMICs at Samsung. Is that correct?  A. Yes, that's correct.").

[FF.II.55]       Mr. Park was shown the JEDEC PMIC specification presented by Mr.

McAlexander at trial.  He testified that Samsung's DDR5 modules both comply with the JEDEC

PMIC specification but do not implement the portions of the PMIC specification Mr. McAlexander

claims are required.  For example, Mr. Park testified that Samsung does not implement Vbias using

an LDO as set out in the PMIC Specification Mr. McAlexander presented to the Court and

identified above:

> Q. I have one question for you on Exhibit number 2, page 13 [JTX0069-0013] that's
> on the screen right now.  In section 2.1.1, the last bullet point says: "3 LDO
> regulators: VBias, VOUT_1.8V, VOUT_1.0V."  Do you see that?
>
> A.  Yes, I see it.
>
> Q.  Okay.  Do you recall your testimony earlier that *in Samsung's PMIC, the*
> *voltage regulator that generates VBias is not an LDO*?  Do you recall that
> testimony?
>
> A.  Yes, I recall.

Bench Trial Tr. (Kyungsoo Park) at 130:20-131:3.

[FF.II.56]       Mr. Park then explained that compliance with the JEDEC standards for

DDR5 did not require the presence of the particular regulators recited in the specifications, only

that certain output voltages are available.  As a result, Samsung could comply with the required

portions of the DDR5 JEDEC standard without implementing the portion of the JEDEC PMIC

specifications that Mr. McAlexander showed at the bench trial and Mr. Park discussed at

deposition:

> Q. So in one respect, Samsung does deviate from the standard in that it does not use
> LDO to generate VBias in two of its PMICs; is that correct?
>
> A.  No.

Q. *Why isn't the use of switch capacitor regulator instead of LDO a deviation from the JEDEC standard?*

A.  When I said 'JEDEC standard', I meant it to be the numbers that are defined by the JEDEC standard.  However, what type being used, that is not considered to be a standard.

THE CHECK INTERPRETER:  It might be slightly different.

*"So when I said JEDEC standards, what I meant was something that it is to be defined using numbers in terms of min and max.  And as to what type is being used here, that would not be my interpretation of the JEDEC standards."*

Q. For topic No. 78, is it your testimony that Samsung's DDR5 PMICs implement all sections of the JEDEC PMIC standards?

A. Yes, it is correct that Samsung's DDR5 PMIC complies with JEDEC's specifications.

Q. And you cannot identify any sections of the JEDEC PMIC standards that Samsung's DDR5 PMICs that do not implement. Correct?

A. Yes, that's correct.

Bench Trial Tr. (Kyungsoo Park) at 131:9-132:5 (emphasis added).

[FF.II.57]      Mr. Park's testimony is consistent with the PMIC Specifications Samsung

submitted at the bench trial, which depict the design of the regulators that can supply the required

output as "Example Schematics," JTX0069 at 28-30:

**2.6    Example Schematic**

Figure 9 shows an example schematic when PMIC is configured in dual phase regulator mode. Table 26, "PMIC Schematic Values" shows all component details shown in the schematics. Note that capacitors C25, C26, C27, C29, C30, C31 represents the lump sum of distributed capacitance across the entire DIMM.

## Figure 9 — Dual Phase Regulator Example Schematic

Figure 10 shows an example schematic when PMIC is configured in single phase regulator mode. Table 26, "PMIC Schematic Values" shows all component details shown in the schematics. Note that capacitors C25, C26, C27, C28, C29, C30, C31 and C32 represents the lump sum of distributed capacitance across the entire DIMM.

**Figure 10 — Single Phase Regulator Example Schematic**
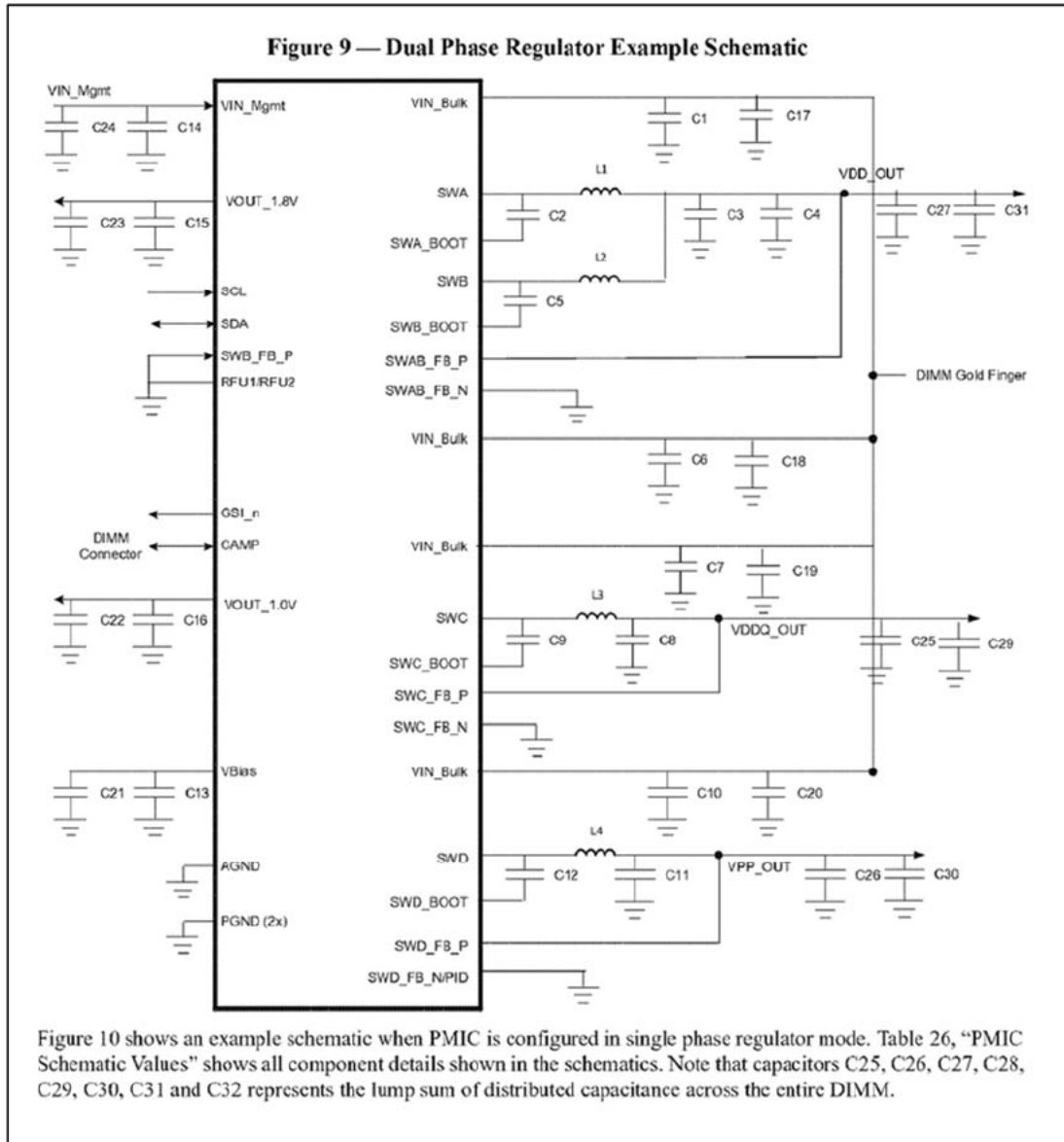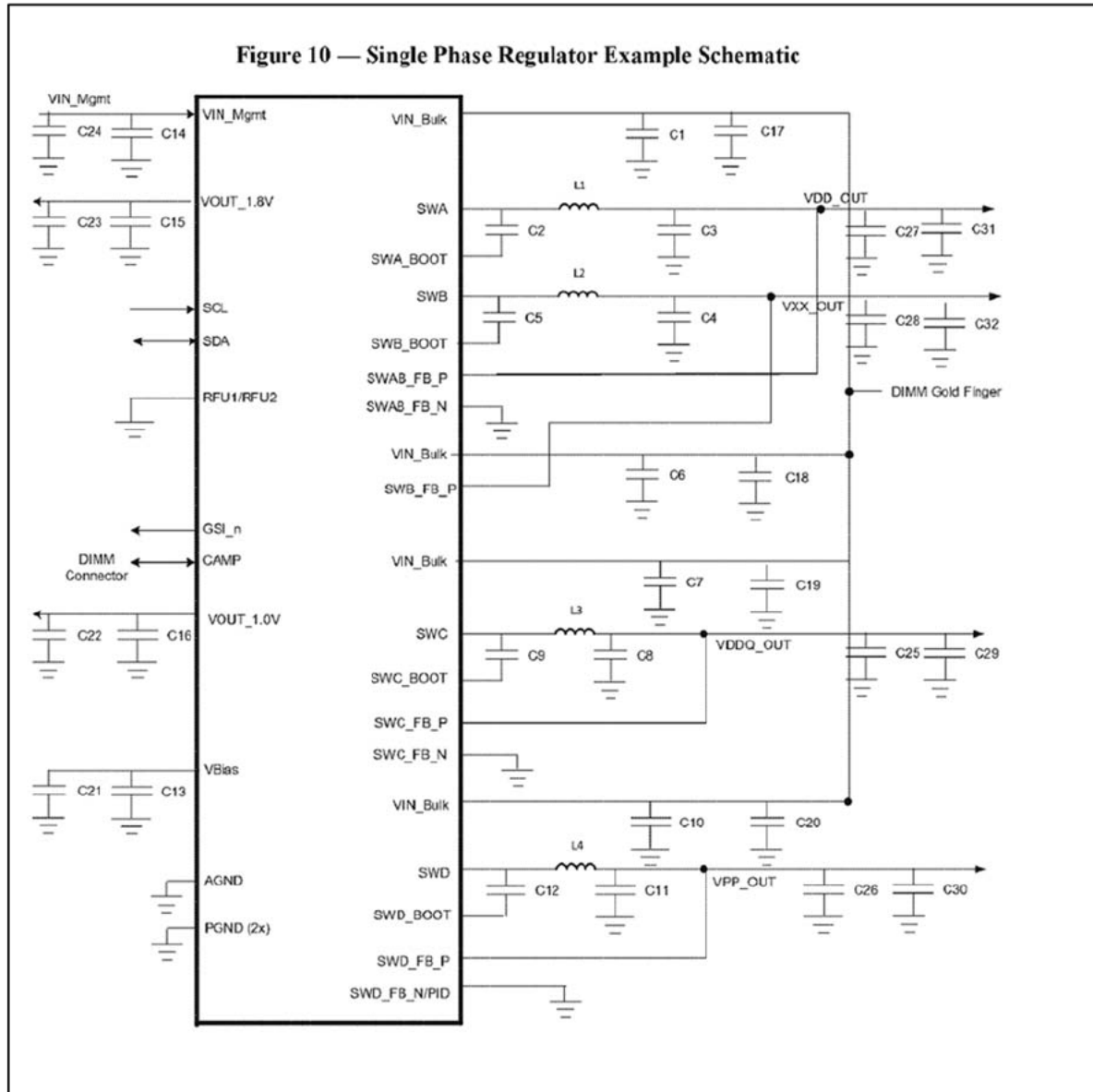


[FF.II.58]     As discussed above, the term "example" is one of the terms that JEDEC

uses to describe a structure that is not required—thus infringement of a patent because of

implementation of this structure does not makes the patent an Essential Patent Claim.  *See* DTX-

02 at 31 ("NOTE ***Essential Patent Claims do not include Patent claims covering aspects*** that are

not required to comply with a JEDEC Standard, or are ***required only for compliance with sections***

***that are marked "example,"*** ''non-normative," or otherwise indicated as not being required for

compliance, or related to underlying enabling technologies or manufacturing techniques not

- 81 -

specified in the standard.") (emphasis added).  Consistent with this, Netlist's operative complaint identified only the outputs and inputs from the PMIC as required, not the internal structures used to create those outputs and inputs.  Dkt. 23 ¶ 97 "[t]he PMIC provides the required regulated voltages, in accordance with the latest DDR5 standards." *See id.* ¶ 110 (accord).

[FF.II.59]      Mr. Park's testimony that compliance with the specification does not require any particular regulators is consistent with the actual specification for DDR5 DIMMs that Samsung submitted into evidence.  DTX-0031.  The DDR5 DIMM standard uses the limiting "must" only for input and output voltages, not for specific structures that generate the voltages. *Id.* at 14:

---

### 4.1   DIMM Voltage Requirements and Power-Up Sequence

The DIMM input voltage requirements and the SDRAM voltage requirements are not identical. The DIMM voltage requirements must meet the PMIC input voltage requirements. The PMIC output voltage requirements must meet the voltage requirements of SDRAM, RCD, Data Buffer, Hub and Temperature Sensors. There must be some allowance for a small voltage drop across the DIMM for both supply voltages and PMIC output voltages.  Table 6 defines the requirements from the Host at the DIMM socket to the PMIC inputs, and the PMIC outputs.

Some DIMMs have lower current requirements. Each specific DIMM configuration must meet the voltage requirements for its worst-case load currents.

#### Table 8 — DDR5 R/LR- DIMM DC Operating Voltage

| Symbol | Parameter | Voltage Rating (Volts) | | | Expected Current (Amps)[3] | Power State |
|--------|-----------|------|------|------|---------------------------|-------------|
| | | Min | Typ[4] | Max | | |
| VIN_BULK | Host Supply Voltage | 4.25 | 12.0 | 15 | 2.5 (maximum) | Operational |
| VIN_MGMT | Host Supply Voltage | 3.0 | 3.3 | 3.6 | 0.110 (maximum) | Operational |
| VDD[1] | PMIC Output Supply Voltage | 1.067 | 1.1 | 1.166 | Note 5 | Operational |
| VDDQ[1] | PMIC Output Supply Voltage | 1.067 | 1.1 | 1.166 | Note 5 | Operational |
| VPP[1] | PMIC Output Supply Voltage | 1.746 | 1.8 | 1.098 | Note 5 | Operational |
| 1.8V LDO[2] | PMIC Output Supply Voltage | Note 6 | 1.8 | Note 6 | 0.025 (maximum) | Operational |
| 1.0V LDO[2] | PMIC Output Supply Voltage | Note 6 | 1.0 | Note 6 | 0.020 (maximum) | Operational |

NOTE 1   The SDRAM specification must be met and takes precedence over this document.
NOTE 2   PMIC, Hub, TS, RCD specifications must be met and takes precedence over this document.
NOTE 3   Maximum current establishes the platform maximum current regulation point. It provides a data point for DIMM developers to set power plane impedances.
NOTE 4   Typical voltage is platform dependent. This is a suggested value only.
NOTE 5   Maximum and Minimum Current ratings depend on PMIC (5000 or 5010), and number of DRAM and Data Buffers placed.
NOTE 6   See PMIC supplier datasheet for Minimum and Maximum ratings.

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[FF.II.60]    The DDR5 DIMM specification Samsung submitted into evidence (DTX-0031) also corroborates the testimony of Mr. Gillingham that "reference designs" in the specifications are not required and can be departed from in implementation in order "to meet all system timing, signal integrity and thermal requirements."

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**1    Product Description**

This standard defines the electrical and mechanical requirements for 288-pin, 1.1 Volt (VDD and VDDQ), DDR5 Registered (RDIMM) and Load Reduced (LRDIMM), Double Data Rate (DDR), Synchronous DRAM Dual In-Line Memory Modules (DIMM). These 288-pin Registered and Load Reduced DDR5 SDRAM DIMMs are intended for use in server, workstation, and database environments.

Reference design examples are included which provide an initial basis for DDR5 RDIMM and LRDIMM designs. Modifications to these reference designs may be required to meet all system timing, signal integrity and thermal requirements for PC5-4000, PC5-4800, PC5-5600, and PC5-6400 support. All DDR5 RDIMM and LRDIMM implementations must use simulations and lab verification to ensure proper timing requirements, signal integrity, power delivery and efficiencies in the design.

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DTX0031 at 7.

[FF.II.61]    At the jury trial, Netlist's infringement expert Dr. Mangione-Smith did not rely on the JEDEC PMIC Specification to prove infringement, even though it was pre-admitted into evidence at Samsung's request.  *See* Jury Trial Tr. (Mangione-Smith) at 334:24-337:10 (referencing JTX0030 and JTX0010).  Nor did Samsung seek to cross-examine Dr. Mangione-Smith on the JEDEC PMIC Specification.  Dr. Mangione-Smith noted that to the extent the LDOs Defendants use are not literally converters, they are the equivalent of a converter.  *Id.* at 337:11-21.  Dr. Mangione-Smith did not testify that merely producing four voltage amplitudes was equivalent to the requirement in the claim that four converters be present, nor that supplying a voltage amplitude from a single converter to multiple different rails can satisfy the claim's requirement for separate converters creating separate voltage amplitudes.  Contrary to Mr. Park's testimony that all that matters for JEDEC is input and output voltages, the claims of Netlist's patents require the presence of four distinct structures used to produce separate output voltages.

[FF.II.62]     At claim construction, Netlist argued that even if two voltage outputs from a PMIC were identical, the claims required that there be separate converters delivering the voltage value:

> But you may need the same voltage but different amps and a different load for another circuit, and that's why the specification expressly describes the voltages as being able to be independent even though they're the same amount, because voltage is only one of the three parameters that describe how you feed the modules that you're dealing where.

2022-11-04 Markman Hearing Tr. at 24:13-19.

[FF.II.63]     Consistent with this argument, the Court explained at claim construction that the claims require physically distinct sources for the voltages. Dkt. 114 at 24 ("The regulated voltages are distinct in the sense they are voltages at different physical outputs, but there is no reason to exclude embodiments in which one or more of the first through fourth voltage amplitudes are the same value.").

[FF.II.64]     At the bench trial, Samsung called Mr. Bruce Lo, a Renesas engineer.  He testified that the PMICs Renesas makes and supplies to Samsung for use in its DDR5 modules "comply" with the JEDEC standard.  He also testified that he was unfamiliar with what was actually "required" by the standard as to the type of regulators that needed to be used.  Bench Trial Tr. (Lo) at 40:4-10 ("Q. And does P8900 fully comply with JEDEC DDR5 PMIC standard?  A. Yes.  Q. So JEDEC requires -- like during the switch-over, the 12-volt is not applied directly to the LDOs, but through an intermediate LDO. Is that right?  A. I don't know. That part, I'm -- I -- I am not sure.").  His testimony is consistent with the testimony of Mr. Park, that compliance with a JEDEC Specification is not the same as adopting the underlying structural examples presented in the JEDEC specifications.

[FF.II.65]     Notably, this difference between, on the one hand, the patent and the evidence used to prove infringement, and, on the other hand, the JEDEC DDR5 specifications, exist even after the Court assumes the jury accepted all of Netlist's infringement contentions.

e.     Both Parties' Final Supplemental Interrogatory Responses Before the Close of Fact Discovery Agreed That the Asserted Patents Were Not Essential

[FF.II.66]     As discussed above, in a supplemental interrogatory response dated November 21, 2022, Netlist contended that the '918 and '054 patents were essential.  Less than a month later, Netlist supplemented its response and made clear that the essentiality was commercial essentiality, not essentiality under the legal standard set out by JEDEC.  As discussed above, Netlist explained in its response that this change was based testimony of Samsung's witnesses. Bench Trial Tr. at 44:14-24 ("Based on subsequent confidential deposition testimony of Samsung witnesses, the necessity of using Netlist patents is a commercial necessity for the sale of Samsung's accused infringing products. As to whether there's a theoretical way of implementing the standards without using Netlist patents, that is irrelevant in this case because the objective evidence demonstrates that Samsung infringes.  Furthermore, Samsung does not claim that the patents are necessary for practicing the standard, which means its infringement involuntary and, thus, its culpability cemented [verbatim].").

[FF.II.67]     As discussed above, in an interrogatory response dated July 11, 2022, Samsung initially took no position on the essentiality of Netlist's patents, instead simply stating that Netlist had failed to prove essentiality.  Bench Trial Tr. at 132:14-25.  On November 10, 2022, Samsung supplemented its answer to contend the patents were not essential.  Bench Trial Tr. at 133:1-6. Approximately a month letter, Netlist supplemented its interrogatory responses to agree. At the bench trial, Samsung did not identify any factual basis as to why this month-long gap represented an untimely supplementation.

[FF.II.68]    At the bench trial, Mr. McAlexander testified that neither the '918 nor the '054 patents is essential. Bench Trial Tr. (McAlexander) at 76:2-24 ("Q. Now, Mr. McAlexander, is it your opinion that the '918 Patent is standard-essential?  A. No, they're not."); Bench Trial Tr. (McAlexander) at 80:5-7 ("Q. (BY MR. McKEON) As to the '054 Patent, is it your opinion that the patent is standard-essential?  A. No.").  Mr. McAlexander did not testify that he opined in his report that the patents would be standard essential if Netlists' infringement contentions were accepted.

[FF.II.69]    Both the position of Netlist and Samsung in their final supplemental interrogatory responses on this issue is consistent with the testimony of Messrs. Park and Lo, and is consistent with a conclusion that to comply with the DDR5 standard, it is not required to have any specific converter structures within the PMIC, only that the PMIC be able to generate specified outputs that feed components on the DDR5 module.  Samsung's witnesses at the bench trial did not dispute that the testimony of Messrs. Park and Lo establishes that the asserted claims do not satisfy the definition of Essential Patent Claims.  If Samsung had attempted to litigate this issue, Dr. Mangione-Smith would have cited this testimony.  And Samsung's expert Mr. McAlexander would have not disputed it in front of the jury, just as he did not dispute that testimony at the bench trial.

[FF.II.70]    This Court does not need to reach the question of whether the asserted claims of the '918 and '054 patents actually satisfy the definition of Essential Patent Claims, as this would be an advisory verdict.

[FF.II.71]    The Court finds that Samsung did not carry its burden of proof of showing that the asserted claims of the '918 and '054 patents satisfy the definition of Essential Patent Claims.

> **2.     Samsung Has Not Proven by Clear and Convincing Evidence that Netlist's Infringement Claims for the '339, '918, or '054 Patent Should Be Barred by Unclean Hands**
>
>> a.     <u>Samsung Incorrectly Represented to the Court that Netlist Did Not Identify Its Essentiality Opinion Until the "Eve of Trial;" Netlist Informed both Samsung and the Court Months Before Trial</u>

[FF.II.72]     Samsung represented to this Court that Netlist only identified its essentiality position on the "eve of trial." *See* Dkt. 509 at 1.  Upon a review of the record, the Court finds that Samsung's statement is not correct.

[FF.II.73]     First, as discussed above, Netlist identified its essentiality positions during the fact discovery period through its supplemental interrogatory response and through the deposition notes of Mr. Hong.

[FF.II.74]     Second, Netlist's briefing to this Court filed on February 3, 2023—almost three months before the scheduled start of the jury trial (at the time, May 1, 2023) and more than a month and a half before the Pretrial Conference—made clear to every party that Netlist was not taking the position that its patents were legally essential as defined by JEDEC and was accepting Samsung's contention of non-essentiality.  For example, in its Motion to Strike Portions of the Rebuttal Expert Report of Paul K. Meyer, Dkt. 214, Netlist stated:

> As Mr. Meyer states in his report, each JEDEC member agrees "to license its Essential Patent Claims on RAND terms and condition." Ex. 1 at ¶ 43. ***Samsung has repeatedly contended and still contends in this case, however, that none of the patents-in-suit are essential to any standard.*** Netlist served an interrogatory to Samsung seeking the following: "With respect to each asserted claim of Netlist Patents-in-Suit, identify whether it is or is not an "Essential Patent Claim" as defined in JEDEC Manual of Organization and Procedure JM21T (September 2020) § 8.2.1, and Set Forth Your Complete Basis for that conclusion." Ex. 3 at 109. "Essential Patent Claim" is defined by JEDEC as "Those Patent claims the use of which would necessarily be infringed by the use, sale, offer for sale or other disposition of a portion of a product in order to be compliant with the required portions of a final approved JEDEC Standard." Ex. 4 at 23. Samsung's response was unequivocal: "Samsung disagrees that any claim is essential to any JEDEC standard and incorporates its response to Interrogatory No. 1." Ex. 3 at 111. ***Likewise, in Netlist's final supplemental interrogatory response on the issue after***

> *completing its technical analysis Netlist stated "Based on subsequent confidential deposition testimony of Samsung witnesses, the necessity of using Netlist's patents is a commercial necessity for the sale of Samsung's accused infringing products. As to whether there is a theoretical way of implementing the standards without using Netlist's patents, that is irrelevant to this case because the objective evidence demonstrates that Samsung infringes. Furthermore, Samsung does not claim the patents are necessary for practicing the standard, which means its infringement is voluntary and thus its culpability cemented."* Ex. 5 (Plaintiff Netlist, Inc.'s Second Supplemental Responses And Objections To Defendants' First Set Of Interrogatories) at 47-48.
>
> Samsung wants to have it both ways: it wants to tell the jury that the patents-in-suit are not essential to any standard, but also that Samsung is entitled to a RAND license because Netlist is asserting "Essential Patent Claims." This is confusing, prejudicial, and contradictory, and will necessitate a sideshow on essentiality that neither side plans to address. *Netlist's experts will not argue that the patents are essential to and therefore infringed by any entity practicing the standard.* Instead, Netlist will show on an element by element bases why Samsung's specific accused designs infringe. *In other words, the jury will not make a determination of whether the patents-in-suit are essential or not essential; the jury will only determine whether Samsung infringes and how much Samsung owes in damages for its infringement.*

*See* Dkt. 214 at 5-6 (emphases added).  Netlist made this same position clear in the Motion to Strike Certain Opinions of Defendant's Expert John B. Halbert, Dkt. 207 at 3, as well as in its additional motions in limine No. 1, Dkt. 379 at 2.

[FF.II.75]     The Court thus finds that Netlist did not misrepresent its essentiality positions to the Court at the Pretrial Conference.

> b.     <u>Samsung Agreed at the Pretrial Conference That Both Parties Would Contend That the Patents Are Not Standard Essential</u>

[FF.II.76]     At the Pretrial Conference, counsel for Samsung repeatedly told the Court that Netlist's patents are not standard essential:

> THE COURT: Well, what's Samsung's position?
>
> MR. CORDELL: Samsung's position was that we – we didn't think they were standard essential[.]

PTC V1 Tr. at 192:10-12.

THE COURT: One more time. What does Samsung's say?
MR. CORDELL: Samsung says they're not standard essential.

PTC V1 Tr. at 192:22-24.

THE COURT: But all that notwithstanding, as we sit here today, Samsung and
Netlist both maintain the position that there are no patents at issue in this case that
are standard essential. Correct?
MR. CORDELL: That is correct.

PTC V1 Tr. at 193:6-10.

[FF.II.77]      At the same time, Netlist made clear to the Court that it could prove up that

the asserted patent claims did not satisfy the definition of Essential Patent Claims:

And so the evidence that we will show is that none of these patents are standard
essential patents.

PTC V1 Tr. at 142:23-24.

[T]he patents are not standard essential, and our expert agrees that the patents are
not standard essential as well.

PTC V2 Tr. at 127:20-22.  Samsung never disputed this proffer or sought to establish that under

Netlist's infringement positions the asserted claims are Essential Patent Claims.

[FF.II.78]      This is not an instance in which Samsung's counsel was caught up in the

moment and did not have time to reflect on the implications of accepting that both parties agreed

that the patents were not essential.  On the third day of the Pretrial Conference, Samsung's counsel

continued to acknowledge this agreement:

MR. COLVIN: Now, there is no dispute in this case, Netlist isn't claiming, and we
agree that these patents are not essential, but that's not what this manual says. It
says they have to disclose patents that are potentially essential.

PTC V3 Tr. at 87:5-16.  Samsung sought to block the Court from taking judicial notice of this

statement, claiming it only related to the "admissibility of a document" phase of the Pretrial

Conference.  *See* Dkt. 526 at 6.  This is a distinction without a difference.  The attorneys who

appear before the Court are expected to be able to speak definitively for their client at the Pretrial

Conference.

        c.        Defendants Failed to Identify any Material Prejudice as to Its Non-Infringement Defense Based on Its Voluntary Agreement that Both Parties Would Accept that the Patents are Not Standard Essential

[FF.II.79]        Mr. McAlexander suggested at the bench trial without explanation that JEDEC specifications could have been used to defend his non-infringement positions.  Bench Trial Tr. (McAlexander) at 96:1-19.



[FF.II.80]        The following JEDEC standards documents were pre-admitted into evidence, and Defendants declined to use them to either cross-examine Netlist's infringement expert Dr. Mangione-Smith or in its own case-in-chief at the jury trial:

- JTX0049 – DDR5 SDRAM

- JTX0057 – DDR4 Data Buffer

- JTX0058 – DDR4 SDRAM

- JTX0069 – Power Management IC

[FF.II.81]      Mr. McAlexander declined to identify at the bench trial any portion of these

documents that supported Samsung's non-infringement positions in a way that was not cumulative

of other evidence available to it.

[FF.II.82]      Mr. McAlexander also claimed that he could have argued that the fact that

Samsung complied with a JEDEC standard and Netlist did not contribute to this standard could

have been used as evidence of non-infringement.  Bench Trial Tr. (McAlexander) at 95:22-25:

> A. Well, they were using the technology the members agreed to use for the JEDEC
> standard and the components that would be applicable to that. So it had nothing to
> do with technology by Netlist; Netlist didn't even contribute.

[FF.II.83]      Practicing a standard is not a defense to infringement.   And Defendants

agreed at the Pretrial Conference that they would not present practicing the standard as a defense

to non-infringement.

> MR. LIVEDALEN: Yes, Your Honor. That's the one point with respect to
> infringement; again, but we're not going to argue that simply practicing a standard
> immunizes us from infringement.

PTC V2 Tr. at 204:8-11.

> (1)   *When Defendants Believed It Was Necessary, They Sought
>       Leave from the Court and Were Permitted to Examine on
>       JEDEC Documents*

[FF.II.84]      The suggestion that Defendants were unable to present JEDEC documents

essential to their defense is inconsistent with the trial record.  For example, Defendants sought and

were granted leave to publish DTX-28 to the jury, a summary of a JEDEC committee meeting that

both Samsung and Netlist attended, and to examine Mr. Milton regarding it:

**Minutes of Meeting No. 60**
**JC-45 Module Committee**

September 10-12, 2018                                                                 Charlotte, NC
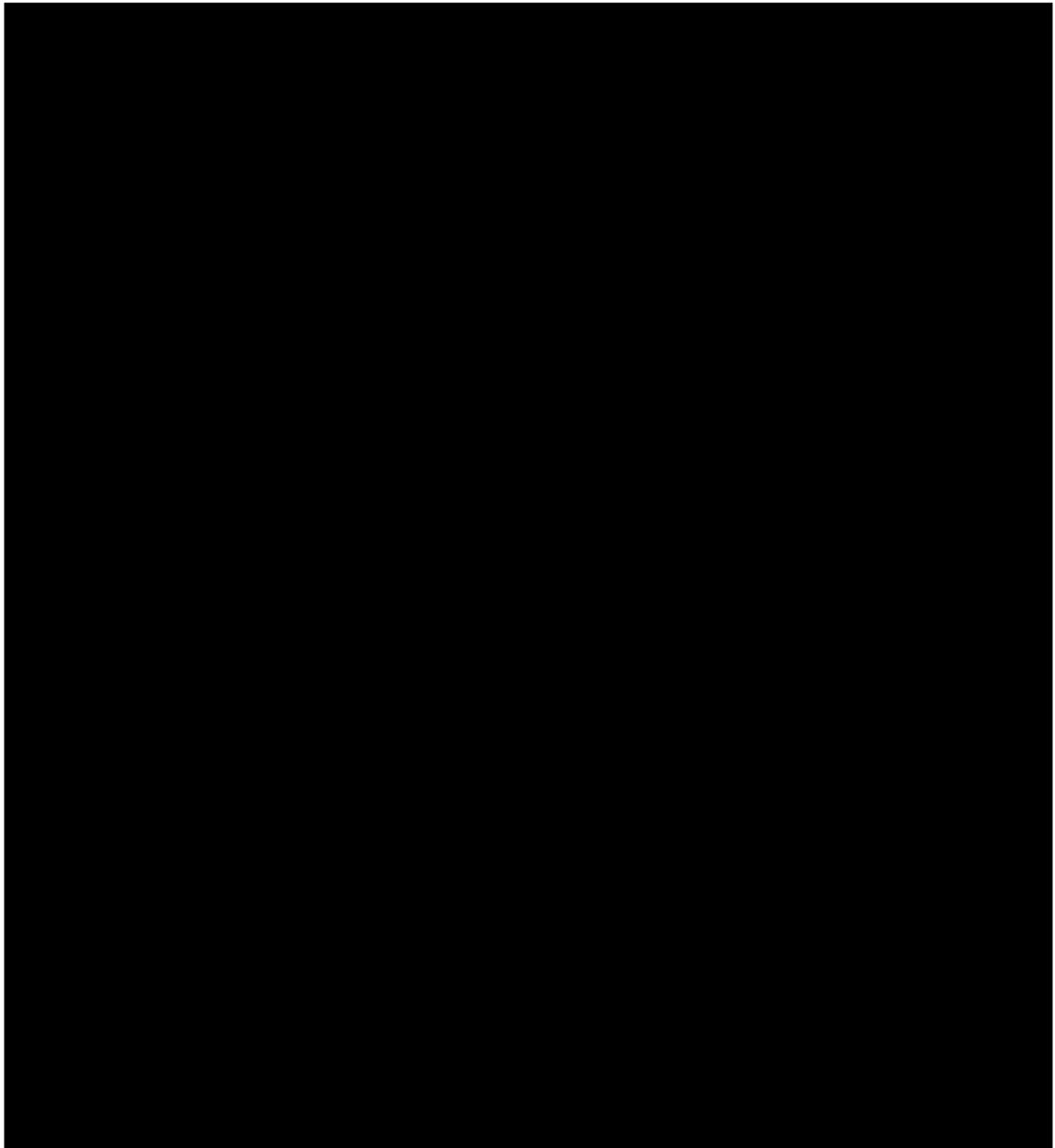


DTX-28.2

SAM-NET00228419

Q. (BY MR McKEON) Now, this is a document, sir, that's from an industry organization and a bunch of people show up and they talk about technology. You familiar with that?

A. I believe this is a JEDEC document, sir. . . .

Q. And Micron, Qualcomm, Renesas, Samsung was there. A whole lot of industry people show up at this meeting. Isn't that right?

A. That is correct.

MR. McKEON: And if I can go to page 4 of this document, and about the bottom there, highlight this.

Q. (BY MR. McKEON) This is one of the things that was discussed at the meeting was DDR5 VR on DIMM requirement for SODIMM and UDIMM. Do you see that?

A. I do.

Q. And SODIMM and UDIMM are accused products in this case. Isn't that right?
A. That is correct. Q. And the DDR5 VR on DIMM means -- this means putting the voltage regulator on the DIMM module. Isn't that right?

A. That is correct.

Q. And that's what you claim you invented in the '918 Patent. Isn't that right, sir?

A. That is correct.
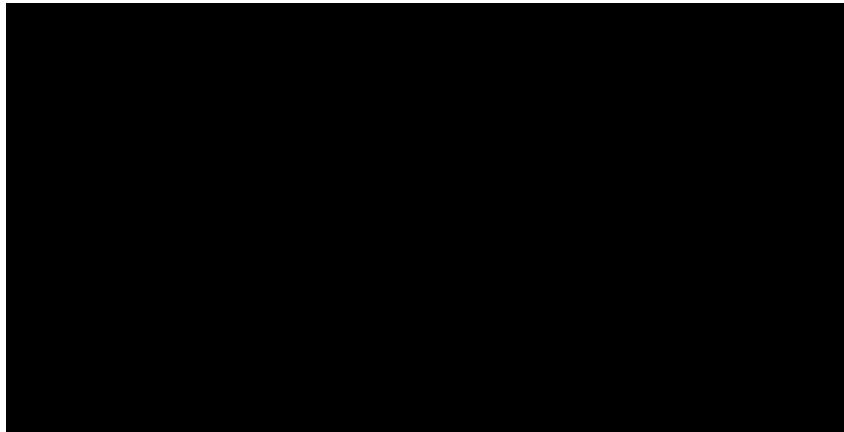


*See* Jury Trial Tr. (Milton) at 274:9-275:13.

[FF.II.85]        The examination spanned more than four pages of the trial transcript, through 278:20, during which Defendants suggested that Netlist was taking positions at trial inconsistent with positions it took in front of JEDEC.

(2)     *The Absence of Discussion of Standard Essentiality Allowed*
*Mr. McAlexander to Avoid Damaging Cross-Examination*

[FF.II.86]         The absence of a discussion of standard essentiality and Defendants' compliance with JEDEC standards immunized Mr. McAlexander from substantial cross-examination.  This corroborates the conclusion that Defendants made a knowing strategic decision at the Pretrial Conference to accept the agreement Netlist that the patents are not essential.

[FF.II.87]         One of Defendants' primary non-infringement arguments was that it employs LDOs, that LDOs and converters are fundamentally different, and that the asserted patents require "converters."

**Samsung Opening**:

There's a lot more that goes into having a converter circuit. You might get some energy back. Right? You can recharge your batteries or run your air conditioners as you downshift, but it's two different approaches. **The Samsung approach with an LDO is kind of crude**. It just heats up and throws away the energy. The converter circuit of the patent is sophisticated, requires a bunch of switching circuitry, and is more difficult."

Jury Trial Tr. at 178:20-179:2.

**McAlexander Direct**:

Q. So what is your opinion then as to whether a converter circuit is the same as an LDO?

A. I have found that the linear regulator, LDO, and the converter circuits are fundamentally different structures.

Jury Trial Tr. (McAlexander) at 892:1-4.

[FF.II.88]         If the jury would have heard that Samsung practices the JEDEC PMIC specification (a statement that is incorrect, as noted above), they could have concluded that this testimony and argument are entirely inconsistent with the specification.  The specification treats both switches (which Defendants describe as converters) and LDOs (which Defendants claims are not converters) as in the same class, "regulators."

### 2.1.1 Common Features summary

Table 1 — PMIC Device Type Summary

| Device Type | SWA | SWB | SWC | SWD | Unit |
|---|---|---|---|---|---|
| PMIC5000 - Current Capability per Phase | 5 | 5 | 5 | 5 | A |
| PMIC5010 - Current Capability per Phase | 3 | 3 | 3 | 3 | A |

- VIN_Bulk input supply range: 4.25 V to 15.0 V
- VIN_Mgmt input supply range: 3.0 V to 3.6 V
- Four step down switching regulators: SWA, SWB, SWC & SWD
- Programmable dual phase and single phase regulator for SWA and SWB
- 3 LDO regulators: VBias, VOUT_1.8V, VOUT_1.0V

JTX0069 at 0013.

[FF.II.89]     Samsung's 30(b)(6) witness Hun-Joo Lee admitted that regulate is a synonym for convert.

> Q.     What does it mean to regulate a voltage?

> A.     That is converting the input voltage to the output voltage that is desirable.

Jury Trial Tr. (Hun-Joo Lee) at 668:10-12.  Thus, the PMIC Specification contradicts the assertion that LDOs and switches are in a different class.

[FF.II.90]     As another example, Mr. McAlexander claimed as one of his non-infringement positions that Samsung DDR5 modules only have two states, one in which they were normally operating, writing and reading data, and one in which they were turned off.

> "As relates to the '054 claims, the DDR5 product has a normal operating state. The other state is it's turned off. So it does not have a second operable state as required by the '054 claims."

Jury Trial Tr. (McAlexander) at 886:6-9.

[FF.II.91]     If the jury would have heard that Defendants practice the JEDEC DDR5 specification, they could have concluded that this argument was entirely inconsistent with the JEDEC PMIC Specification, which defines a number of operational states, including ones in which no writing or reading to memory occurs, but the module is not "off."  The PMIC Specification

Section 2.7 is entitled "Functional *Operation*."  JTX0069 at 0032 (emphasis added).  This section

describes a large number of operating states, including, for example, "Power Up Initialization," in

which no reading or writing occurs bot the module is not "off."  JTX0069 at 0033.

---

**2.7.2   Power Up Initialization Sequence**

During power on, the host shall:

1. Ramp up VIN_Mgmt supply; Ramp up VIN_Bulk supply; (No timing relationship between two supplies)
2. Hold VIN_Mgmt supply stable for a minimum of tVIN_Mgmt_to_Enable time
3. Hold VIN_Bulk supply stable for a minimum of tVIN_Bulk_to_Enable time
4. Query the status of the PMIC status register to determine if it is safe to enable VR.
5. If it is safe to enable, send VR Enable command by setting register Table 140, "Register 0x32" [7] = '1' or by issuing DEVCTRL CCC.

---

Another example is Power Down.  JTX0069 at 0038:

---

**2.7.5   Power Down Output Regulators**

Regardless of how PMIC's output regulators are turned on, the PMIC's output regulators are powered down as described below depending on mode of operation.

In non write protect mode of operation, the PMIC allows host to power down any or all output regulators in non write protect mode. The host can disable PMIC's any or all output regulators by any of the three methods below.

1. The VR Disable command (Table 140, "Register 0x32" [7] = '0').The PMIC executes power off sequence config0 (Table 169, "Register 0x58") to power off sequence config3 (Table 172, "Register 0x5B,") to preserve the appropriate voltage relationship as configured by the DIMM vendors. The PMIC keeps the CAMP signal floating (i.e. it remains High) because this is an intentional command from the host and not a fault condition. Note that host can re-enable the PMIC's output regulator by issuing VR Enable command. The PMIC executes power on sequence config 0 to config 3 registers and keeps the CAMP signal floating (i.e it remains High).
2. Configuring one or more bits in Table 137, "Register 0x2F" [6:3] to '0' in any specific sequence that is desired by the host.The PMIC does not execute power off sequence config0 (Table 169, "Register 0x58") to power off sequence config3 (Table 172, "Register 0x5B,") on its own. The PMIC keeps the CAMP signal floating (i.e it remains High) because this is intentional command from the host and not a fault condition. Note that host can re-enable any of disabled output regulators by configuring one or more bits in Table 137, "Register 0x2F" [6:3] to '1' in any specific sequence that is desired by the host. The PMIC keeps the CAMP signal floating (i.e it remains High).
3.  By driving CAMP input low. The PMIC executes power off sequence config0 (Table 169, "Register 0x58") to power off sequence config3 (Table 172, "Register 0x5B,") to preserve the appropriate voltage relationship as configured by the DIMM vendors.

---

Power down produces what is described as "write protect mode of operation."  JTX0069 at 0039.

In write protect mode of operation, the host can disable PMIC's all enabled output regulators by any of the two methods below.

1.  Power cycle the PMIC.
2.  By driving CAMP input low. The PMIC executes power off sequence config0 (Table 169, "Register 0x58") to power off sequence config3 (Table 172, "Register 0x5B,") to preserve the appropriate voltage relationship as configured by the DIMM vendors.

In this mode, no writing to memory can occur, but the module is not "off."  To the contrary, it remains "on" to monitor and rejected requests from the memory controller.  JTX0069 at 0040:

**2.7.7.1 Register Write Protect Function**

By default, PMIC register write protect function is enabled (i.e. Table 137, "Register 0x2F" [2] = '0'). The CAMP input signal level determines when PMIC enters or exits the write protect mode. The PMIC enters the write protect mode when CAMP signal is at logic level High. PMIC exits the write protect mode when CAMP signal is at logic level Low. When PMIC is in write protect mode, the PMIC does not allow to modify registers Table 111, "Register 0x15" to Table 137, "Register 0x2F", Table 140, "Register 0x32" in the host region as well as Table 152, "Register 0x40" to Register 0x6F in the DIMM vendor region. These registers are write protected marked with RED color cells in "Register" column in Table 93, "Host Region - Register Map". The PMIC simply ignores the host request for write operation in write protect mode. PMIC allows all register read access in write protect mode.

[FF.II.92]        As another example, Samsung repeatedly claimed that there was no flash "memory" on its products.

> For the ''918 and '054, we think that answer is going to be no. You already know that the memory that we're talking about here, the DDR5, which is double data rate 5 memory that we're talking about here, is all DRAM. **There's no flash, ladies and gentlemen**. So right away, and you have to kind of wonder, because they -- what they put in their written description was DRAM and flash.

Jury Trial Tr. at 177:2-8.

[FF.II.93]        At trial, Mr. McAlexander admitted that flash is non-volatile memory:

Q.        And non-volatile memory, flash is non-volatile memory?

A.        Flash is a type of non-volatile, yes.

Jury Trial Tr. (McAlexander) at 938:19-20.

[FF.II.94]        If the jury would have heard that Defendants practice the JEDEC PMIC specification, they could have concluded that the argument that Samsung's modules do not have

flash memory is totally inconsistent with the JEDEC PMIC specification, which describes the presence of "Non-Volatile Memory," JTX-0069 at 0014, which Mr. McAlexander admitted is "flash."

- Automatic switchover from VIN_Mgmt input supply to VIN_Bulk input supply
- Error injection capability
- Persistent Error log registers
- Write protect mode and programmable of operation
- Independently programmable output voltages, power up and power down sequence for switch regulators
- Input and output power good status reporting mechanism
- VIN_Bulk input supply protection feature: Input over voltage
- Output switch regulators protection feature: Output over voltage, output under voltage, output current limiter
- Output current and power measurement, output current threshold mechanism
- Temperature measurement, temperature warning threshold, critical temperature shutdown
- Multi Time Programmable Non-Volatile Memory
- Programmable and DIMM specific registers for customization
- General Status Interrupt Function
- Flexible Open Drain IO ($I^2C$) and Push Pull (I3C Basic) IO Support

      (3)      *The Absence of Discussion of Standard Essentiality Allowed Samsung to Avoid Damaging Admissions from its Corporate Witnesses that Could Have Been Used to Show Infringement and Patent Value*

[FF.II.95]      One of Samsung's primary defenses at trial was that Netlist was a failed company and that no one wanted Netlist's technology.

**Defendants Opening**:
And they tried to make a product out of it, ladies and gentlemen. But here's the problem. Nobody wanted it. Nobody wanted it. And so Netlist came up with this combination DRAM flash hybrid, and they tried to sell it.

Now, you heard a lot from Mr. Sheasby about these documents where there was some collaboration between Samsung and Netlist, and there was, but it was about this product. It that was. It just didn't sell. It wasn't a big seller. was about this hybrid flash DRAM product that ultimately nobody wanted. We don't have to even figure out whose fault that was. It just didn't sell. It wasn't a big seller.

But what did -- what did they do? Well, they didn't say, okay, you know, our product didn't sell, wasn't that good an idea. Instead, they used something that Mr.

Sheasby brought up right at the end there. I don't know if you recall it. He talked about some stuff that can happen at the Patent Office.

Jury Trial Tr. at 168:16-169:6.

**Cross-Examination of Mr. Milton**:

Q. It's in qualification. But you weren't trying to mislead the jury when you suggested that and showed them the product that you were on the market for that product and selling it and competing with others. Is that right?

A. That was not my intention.

Q. And Netlist does not make or sell DDR5 UDIMM. Right?

A. That is a correct statement.

Q. And you don't sell or make DDR5 SO-DIMM. Is that right?

A. That is a correct statement.

Jury Trial Tr. (Milton) at 232:11-19

Q. Netlist today does not make or sell any of the types of DDR4 or DDR5 products that are accused of infringement in this case. Correct?

A. Okay. Correct.

Jury Trial Tr. (Milton) at 233:5-8.

[FF.II.96]       If the parties tried a case in which Netlist could argue that the patents were essential, and Samsung's only defense to essentiality was the same as its non-infringement defenses, this could have been used by Netlist to argue before the jury that the entire industry had adopted Netlist's technology, and that it was not failed technology.

[FF.II.97]       This would have been corroborated by the repeated admissions of Samsung's corporate representatives that they implement the standards:

Q. You've been designated to speak on behalf of Samsung as to technical topics relating to DDR4 LRDIMMs?

A. That's correct.

Q. Do you test to confirm that the RCDs and data buffers comply with the JEDEC standard for LRDIMM DDR4?

A. You mean the RCD and DB?

Q. Yes.

A. Yes.

Q. Have you ever encountered any instances or sold any LRDIMM DDR4s that did not implement the JEDEC standard for LRDIMM DDR4?

A. No, I have not.

Q. Has Samsung?

A. Samsung has not.

Bench Trial Tr. (Seung Mo Jung) at 128:18-129:6

Q. For topic No. 78, is it your testimony that Samsung's DDR5 PMICs implement all sections of the JEDEC PMIC standards?

A. Yes, it is correct that Samsung's DDR5 PMIC complies with JEDEC's specifications.

Q. And you cannot identify any sections of the JEDEC PMIC standards that Samsung's DDR5 PMICs that do not implement.  Correct?

A. Yes, that's correct.

Bench Trial Tr. (Kyungsoo Park) at 131:23-132:5.

[FF.II.98]        These admissions would have been particularly damaging in light of the

testimony that Samsung's representatives could not identify any basis for why the patents are not

infringed, and could not identify any alternatives:

Q. So for topic No. 17, which is the presence or absence of acceptable non-infringing alternatives to the inventions claimed in the Netlist patents-in-suit, what would be your testimony?

A. Okay. First of all, I do not have any opinion in this -- that regard because I can give you testimony on the operation of DDR, PMIC, DDR5 PMIC. However, as to patents, I cannot render any opinion.

Q. What investigation did you do with respect to topic No. 17?

A. I did not conduct any investigation in that regard.

Jury Trial Tr. (Kyungsoo Park) at 643:10-20.

> Q. As Samsung's corporate representative on the operation of its power management functionality in its DDR5 modules, what is the basis for why Samsung believes it does not infringe these patents?
>
> A. Since I do not know about -- know about these patents, I do not know what the basis are.
>
> Q. What is the credible basis for why Samsung does not infringe Netlist's patents?
>
> A. It's not possible for me to answer that because, as I already told you, I don't really know about those patents.
>
> Q. And you understand you're Samsung's corporate representative on its DDR5 power management technology.  Correct?
>
> A. Yes.  […]
>
> Q. Did you do anything to investigate or determine whether Samsung is infringing Netlist's patents?
>
> A. No.
>
> Q. Can you explain why Samsung believes it doesn't infringe Netlist's patents?
>
> A. No.

Jury Trial Tr. (Hun-Joo Lee) at 666:18-667:6, 672:9-14.

d.      Defendants Failed to Identify any Material Prejudice as to Their Damages Case Based on Their Voluntary Agreement that Both Parties Would Accept that the Patents are Not Standard Essential

[FF.II.99]      At the bench trial, Samsung called its damages expert to present testimony on what he described as "RAND" damages.  This testimony was 1) excluded from the jury trial on a basis other than the issue of essentiality, and thus has no connection to Samsung's unclean hands defense; 2) would have been legally improper to present to the jury.

(1)     *Samsung Told the Court that any Party Who Takes the Position that Patents Are Not Standard Essential Should Not Be Entitled to Discuss RAND Before the Jury*

[FF.II.100]      The Court ultimately decided that RAND issues should not come before the jury because neither party contended that the patents-in-suit were standard essential.

[FF.II.101]      Samsung took the position at the Pretrial Conference that any party who maintains that patents are not standard essential should not be entitled to discuss RAND before the jury, and actively prevented Netlist's expert witness from discussing RAND at the jury trial:

> THE COURT: Well, we'll get to that when we get to that. You're arguing to me about Mr. Kennedy's opinion with regard to RAND. I'm trying to determine if there's any relevance to RAND opinions in a case where there are no standard essential patents at issue.
>
> MR. CORDELL: Well, I would say it slightly differently. He shouldn't be allowed to testify as to RAND if -- if his client, if the party who has sponsored him, is taking the position that they're not standard essential.

PTC V1 Tr. at 193:20-194:3.  This assertion is not factual evidence.  It is a statement of Samsung's legal contentions.

[FF.II.102]      The Court thus finds that Samsung asked this Court to prevent RAND from being discussed at the jury trial by any party who contended the patents are not standard essential.

(2)      *RAND Obligations Only Apply to Actually Essential Patents.*

[FF.II.103]      As discussed above, the JEDEC Patent Policy sets out the extent to which a JEDEC member has an obligation to offer to license its patents on RAND terms.  Specifically, the JEDEC Patent Policy states that only "Essential Patent Claims" are subject to RAND obligations, and that "Essential Patent Claims" are expressly defined by the JEDEC Patent Policy.  DTX-02 at 34, 31.

[FF.II.104]      To be clear, it is not enough that Netlist or Defendants believed the patents are essential.  The JEDEC Patent Policy deals with believed essential patents under the definition "Potentially Essential Patent Claim."  There is a duty of disclosure in certain circumstances as to these patents.  But the RAND obligation does not attach to "Potentially Essential Patent Claim[s]." It only attaches to "Essential Patent Claim[s]."

[FF.II.105]     This Court need not reach the question of whether a RAND obligation attaches to the '339, '918, or '054 patents, as this would be advisory.  This is because Defendants have not proved by clear and convincing evidence that the asserted patent claims satisfy the definition of Essential Patent Claims, and therefore, that a RAND obligation applies.  This is the case even when Court assumes the jury accepted Netlist's infringement positions.

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(3)     *Mr. Meyer Presented Opinions at the Bench Trial that this Court Excluded for Reasons Unrelated to Standard Essentiality*

</div>

[FF.II.106]     At the bench trial, Samsung identified alleged "RAND offers" that Netlist made to Samsung and at the ITC as evidence it would have presented.  First, Samsung identified DTX-32.  DTX-32 is a June 8, 2022 letter from Jayson Sohi, Legal Counsel, Director of IP Strategy at Netlist, to Dr. Jung-Bae Lee, President of Samsung (and others).  The letter states on the face of every page that it is "CONFIDENTIAL – SUBJECT TO F.R.E. 408."  DTX-32.  At the Pretrial Conference, the Court struck references to this document from Mr. Meyer's expert report on the basis that it is a settlement communication governed by Rule 408.  PTC V1 Tr. at 249:4-10 ("With regard to the settlement discussions governed by Rule 408 and the particular letter that's been referenced in the argument today, I'm going to grant that. I do believe it falls under Rule 408. It's being used to disprove the amount of a disputed claim, and I think that's what the rule stands to protect against.").  The Court finds that Samsung's introduction of this letter at the bench trial in an attempt to prove its alleged unclean hands defense is rearguing the Court's ruling on Netlist's motion to strike.  An unclean hands defense is not a chance to re-litigate a denied motion.  *See In re Prudential Ins. Co.*, 232 F. App'x 161, 166 (3d Cir. 2007) ("[W]e must reject the [party's] attempt to relitigate this issue by raising the specter of 'unclean hands.'").  This communication was properly excluded from the jury trial.

[FF.II.107]     Second, Mr. Meyer employed an analysis from Mr. Gregory Sidak regarding a FRAND licensing range for DDR4 LRDIMMs.  Mr. Meyer testified at the bench trial that this study was relevant because it was attached to DTX-32.  Bench Trial Tr. (Meyer) at 118:3-12 ("Q. All right. And let's talk about other evidence you relied on in this case. Are you aware of any other rates that Netlist considered to be RAND? A. Right. In the communication to Samsung, they pointed out a study by Mr. Sidak.  He did an analysis on behalf of Netlist. In his analysis he determined a FRAND range, and he said that FRAND range -- this is for DDR4 LRDIMMs. He said that the royalty -- any amount up to $34.27 would be an LRDIMM memory RAND rate. So he said fair reasonable and -- and that leads down to non-discriminatory. Q. And that's the DTX-32 letter we talked about earlier? A. That's correct.").  The Court struck Mr. Meyer's discussion of this study from his report at the Pretrial Conference on two grounds.  The study Mr. Meyer refers to is attached to DTX-32, which, as discussed directly above, is a Rule 408 settlement communication that Samsung is attempting to use to disprove damages in this case.  As explained above, this communication—and attachments thereto such as this study—were properly excluded from the jury trial.

[FF.II.108]     In addition, Mr. Sidak's analysis was performed in his role as an expert hired by Netlist in connection with Netlist's 2017 ITC litigation.  Mr. Meyer's expert report states this expressly: "Kennedy's claimed per unit royalty rates are unreasonable and excessive…compared to the alleged ███████████████████████████ ████████████████████████████████████████████ ██████████  ¶ 210.  The Court struck this discussion from Mr. Meyer's report on the basis that it sought to introduce expert analysis from another litigation and had limited probative value.  PTC V1 Tr. at 249:11-15 ("With regard to the expert analysis from the 2017 ITC action, I've made

it clear earlier today that the ITC action is an adjudicatory process that has limited probative value

and a high risk of confusion. I'm going to grant that portion of the motion, primarily on a 403

analysis.").   The Court finds that Samsung's introduction of this study at the bench trial in an

attempt to prove its alleged unclean hands defense is an attempt to reargue the Court's ruling on

Netlist's motion to strike.

<div align="center">

(4)    *Mr. Meyer's Damages Analysis Was the Same Regardless of any RAND Obligation.*

</div>

[FF.II.109]      Mr. Meyer testified at the bench trial that he applied the same methodology

for all five of Netlist's patents, including the '060 and '160 patents which neither party has ever

contended are essential.   He testified that his methodology included analyzing every *Georgia-*

*Pacific* factor and that he did not adjust any of the factors to reflect a RAND commitment:

> Q. Sure. You didn't alter the *Georgia-Pacific* factors in any way in your damages report. You used the traditional *Georgia-Pacific* factors.
>
> A. I don't understand. When you say -- these are the factors. That's what I followed.
>
> Q. And you didn't remove any of them or consider any of them irrelevant or change any of them. Correct?
>
> A. I don't really understand the question. I didn't change the factors.
>
> Q. For example, you didn't ignore Factor 4. Correct?
>
> A. Are you saying did I ignore it?
>
> Q. Yes.
>
> A. No. I mean, I'm documenting -- I considered it and it was neutral.
>
> Q. And you didn't ignore Factor 5. Correct?
>
> A. I did not ignore it, if I understand your question.
>
> Q. Okay. And you did not ignore Factor 8. Correct?
>
> A. I guess I really don't understand what you're asking me.
>
> Q. Did you consider Factor 8?
>
> A. Yes, in my analysis overall, yes, I did.
>
> Q. And did you consider Factor 9 and Factor 10 in your analysis?
>
> A. Yes.

<div align="center">

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Bench Trial Tr. (Meyer) at 120:13-121:10.

[FF.II.110]    In *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1230 (Fed. Cir. 2014),

the Federal Circuit made clear that a *Georgia-Pacific* analysis of RAND-encumbered patents

requires adjustment of those factors:

> In a case involving RAND-encumbered patents, many of the *Georgia–Pacific* factors simply are not relevant; many are even contrary to RAND principles. *See* Br. of Amici Curiae American Antitrust Institute ("AAI Br.") 11–20 (arguing that the *Georgia–Pacific* factors are not appropriate for determining RAND royalties). For example, factor 4 is "[t]he licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly." *Georgia–Pacific*, 318 F. Supp. at 1120. Because of Ericsson's RAND commitment, however, it cannot have that kind of policy for maintaining a patent monopoly. *See Microsoft,* 2013 WL 2111217, at *18. Likewise, factor 5—"[t]he commercial relationship between the licensor and licensee"—is irrelevant because Ericsson must offer licenses at a *non-discriminatory* rate. *Georgia–Pacific,* 318 F.Supp. at 1120; *see Microsoft,* 2013 WL 2111217, at *18.

*Id.* at 1230-31.

[FF.II.111]    The Federal Circuit goes on to identify that "[s]everal other Georgia–Pacific

factors would at least need to be adjusted for RAND-encumbered patents—indeed, for SEP patents

generally," *id*., including Factors 8, 9, and 10 (in addition to Factors 4 and 5 identified above).  *Id.*

The Federal Circuit specifically identifies Factors 5 and 10 as "irrelevant."  As noted above, Mr.

Meyer testified that he did not adjust any of those factors on the basis that the '339, '918, or '054

were allegedly RAND-encumbered patents, and testified that he considered all of the factors and

did not "change" any of them.

[FF.II.112]    Mr. Meyer applied the same apportionment methodology for all patents in

the case, including the '060/'160 patents, which neither party has ever contended are essential.

> Q. And there were three sets of patents at issue in this case. They're broadly related to DDR5, to DDR4, and to HBMs. Correct?
>
> A. There were three accused product categories, if that's your question.

Q. And you applied the identical damages analysis to all three of those products. Correct?

A. I followed *Georgia-Pacific* when I was doing my analysis to all the accused products to come up with my opinions, if that's your question.

Q. But your per-unit methodology was the same for HBM, for DDR3 -- DDR4, and DDR5?

A. I don't really understand that. If the question is is that DDR5 $1.10 a portfolio rate, yes, it is. I didn't really do you a separate -- as you know from my report, I was rebutting Mr. Kennedy, so I considered all the factors, but I don't really -- when you I didn't ignore something or I didn't do something differently, I don't understand that.

Q. Sir, your damages analysis on your conclusion on apportionment is in paragraph 301 of your report. Correct?

A. I can look at my report.

Q. Please do so.

A. One sec. I'm in paragraph 301, sir. So what was your question, please?

Q. You applied the same per-unit apportioned rate for each of the asserted patents of .5 -- .055 cents.

A. Ultimately I determined the portfolio rate, if that's your question, across the products, yes, sir, on the Hynix deal.

Q. And you didn't do a different methodology for HBM for DDR4 or DDR5. Correct?

A. I didn't see the need to, if that's your question.

Bench Trial Tr. (Meyer) at 121:11-122:17.

[FF.II.113]     When RAND applies to a patent, the Federal Circuit requires that specific adjustments be made to the Georgia-Pacific factors.  Mr. Meyer did not make any of these adjustments in his report.  Thus, there was no "RAND" damages analysis that he could have provided different from the analysis that was in his report and which he in fact provided to the jury.  A reasonable inference from Mr. Meyers report is that because "RAND" obligation could only theoretically have applied to three of the five patents in suit, he wanted to avoid the analysis because it could have led the jury to believe it could award a higher rate for the HBM patents.

(5) *Mr. Meyer Did Not Apply the JEDEC Patent Policy at the Bench Trial*

[FF.II.114]   At the Bench Trial, Mr. McAlexander calculated that the $40 million payment Netlist received from SK Hynix resulted in a rate of $1.10 per unit, compared this to what he claims were the rates advanced by Netlist, and testified that "Mr. Kennedy's rates were discriminatory."  Bench Trial Tr. (McAlexander) at 117:16-23.

[FF.II.115]   Whether a damages request is "discriminatory" is not relevant to the JEDEC RAND commitment.  Although there are some SSOs that prohibit discrimination *vel non*, JEDEC is not one of them.  Mr. Meyer admitted at trial that "the standard under the JEDEC obligations is no ***unfair*** discrimination."  Bench Trial Tr. (Meyer) at 123:2-5 (emphasis added); *see also* DTX-02.34 (JEDEC Patent Policy) ("A license will be offered, without compensation, under reasonable terms and conditions that are free of any ***unfair discrimination*** to applicants desiring to utilize the license for the purpose of implementing the JEDEC Standard…") (emphasis added).  Mr. Meyer testified that he did not analyze whether there was any ***unfair*** discrimination:

> Q. And you didn't use the word 'unfair' once in your direct testimony. Correct?
>
> A. I don't believe I used that word. [sustained objection omitted].
>
> Q. (BY MR. SHEASBY) And, sir, in your report you never describe -- you didn't point to any section of your report that describes the terms of Mr. Kennedy's proposal as unfair; only discriminatory. Correct?
>
> A. I used the word 'discriminatory'. That's correct. I agree with that.

Bench Trial Tr. (Meyer) at 123:6-18.

[FF.II.116]   The Federal Circuit holds that any RAND analysis must look at the "patentee's actual RAND commitment."  *Ericsson*, 773 F.3d at 1231.  Mr. Meyer failed to analyze in his report whether any alleged discrimination was "unfair," and thus Mr. Meyer's analysis is not tethered to the actual RAND commitment as set out by JEDEC.  The Court finds that allowing

Mr. Meyer to present a legally incorrect "discrimination" analysis to the jury (assuming the patents-in-suit were RAND-encumbered, which this Court has found Defendants have failed to prove), would have been prejudicial, irrelevant, and contrary to law.

[FF.II.117]      At trial, Mr. Meyer was allowed to extensively discuss the SK Hynix agreement with Netlist, including presenting the argument that Samsung and SK Hynix would want "the same deal." Jury Trial Tr. at 1171:4-1172:8.  He was also allowed to present his $1.10 per unit number. *Id.*, at 1172:12-1174:17.

[FF.II.118]      There is a reason why Mr. Meyer did not opine in his report that there was "unfair" discrimination.  Mr. Meyer's report entirely ignored the value of the supply agreement in the SK Hynix agreement by deciding it was not enforceable.  This was briefed in Netlist's Additional Motions *in Limine* #2:

> Netlist disclosed in fact discovery that the supply obligation in the SK Hynix agreement was a material part of the consideration Netlist received. Ex. 18 (Netlist's First Supplemental Responses and Objections to Defendants' Third Set of Interrogatories) at 8-9. Nonetheless, Mr. Meyer's rebuttal expert report, to which Netlist does not get a response, opines that "nothing in the agreement required either party to purchase or sell any products unless and until a valid purchase order was issued and accepted." Ex. 4 at ¶ 227. This is a legal conclusion for the Court. Ex. 6 (Meyer Deposition (rough)) at 253:16-22 ("Q. [W]hen is the last time you've interpreted legal obligations understand a supply agreement? THE WITNESS: I don't interpret legal obligations."); *id.* at 255:12-15 ("Q. Sir is the plain language of will a term of obligation or a term of optionality? THE WITNESS: I have no opinion on that.").   Dkt, 379 at 4.
>
> Samsung never disclosed in discovery its theory that the supply obligation in the SK Hynix agreement is unenforceable until its rebuttal expert report. This was despite an interrogatory expressly asking Samsung for its analysis on comparability in which it identified the agreement. *See* Ex. 1 at 111 (Interrogatory No. 8: "For each license agreement that You believe is relevant to a reasonable royalty analysis, identify the license agreement, Your interpretation of the royalty rate and structure set forth in the license agreement, and all factual and legal bases for why it is (or is not) a comparable license."). Samsung made no reference to the SK Hynix agreement as comparable, much less that its supply obligation was unenforceable. Samsung's damages expert Mr. Meyer admits that he is not a legal expert and cannot interpret the contract. Ex. 3 (Meyer Depo) at 272:24-273:2 (Q. So you're

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qualified to interpret contractual supply language? A. No.); id. at 274:16-17 ("I don't interpret legal obligations."). As a result, if Samsung intends to argue to the jury that the contract term unenforceable, in the Fifth Circuit it is the job of the Court through limine practice to stop the usurpation of its power. *Owen v. Kerr-McGee Corp.*, 698 F.2d 236, 240 (5th Cir. 1983).

Dkt. 405 at 3.

[FF.II.119]   The Court excluded any argument that the supply obligation was not binding.   Dkt. 432, at 10 (Grant MIL No. 2.).   If Mr. Meyer would have sought to present an "unfair" discrimination analysis in his report (he did not), he would have properly been precluded from opining that any discrimination was "unfair" based on a failure to consider that the supply obligation was binding.

[FF.II.120]   Finally, a RAND analysis for the purposes of damages is not appropriate under the JEDEC Patent Policy.  Section 8.2.8 makes clear that although a RAND commitment requires a license to be offered, JEDEC places no limits on its terms. DTX-02 at 36. JEDEC makes no representation as to the reasonableness of any terms or conditions of the license agreements offered by such patent rights holders, and all negotiations regarding such terms and conditions must take place between the individual parties outside the context of JEDEC.

> (6)   *Any Assertion of RAND Rights Would Have Resulted in Netlist Seeking to Present the Jury with Evidence Regarding Why Samsung Previously Lost Its License*

[FF.II.121]   If Samsung had presented a RAND argument to the jury, Netlist would have contended that this opened the door to Netlist's evidence and argument that Samsung waived its right to a RAND commitment due to unethical behavior.  Netlist expressly identified this argument in its Rule 26 Disclosures.  Ex. 1 (2022-06-08 Netlist Initial Disclosures) at 4 ("Netlist further contends that because of Samsung's bad faith and non-RAND conduct, it has forfeited its right as a third-party beneficiary to Netlist's RAND obligations.").  The Federal Circuit has held that a RAND-commitment is not a perpetual one-way option.  For example, it contemplates that a patent

holder who committed to RAND can still be entitled to an injunction.  *See Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1331-32 (Fed. Cir. 2014), *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) ("[A]n injunction may be justified where an infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect.").

[FF.II.122]     As just one example of the evidence Netlist could have presented to the jury, Samsung's own corporate representative testified at the bench trial that Samsung's behavior was unethical.

> Q. So if we look at Exhibit 14, this is an email from Steve Metz at Samsung to other Samsung employees saying that he called Netlist and let them know that Samsung had zero allocation in Q3 to support Netlist and/or the end customers Netlist is currently supporting.
>
> Q.  Do you see that?
>
> A. Yes, I see it.
>
> Q. And he says, "Since Samsung is nearly a hundred percent of their support and revenue, this will have a dramatic impact on their -- their financials and future business." Do you see that?
>
> A. I see it.
>
> . . . .
>
> Q. Was it ethical for Samsung to cut off a hundred percent of Netlist's product supply knowing that it would destroy Netlist's business?
>
> A. If a yardstick based on whether something is ethical or not is forced on me, and I think I'm being forced to determine this, then I would consider it to be unethical. So the answer is yes.
>
> . . . .
>
> Q. Some chief was -- was -- decided that Netlist would get 500K per month, and this was to be communicated to Steve Metz and Steve Metz was to communicate it to Neal Knuth. Correct?
>
> A. That's how this email flows.

Q. And then at the top, it says, "It's 500K per month...not immediately but after a week...LOL." Do you see that?

A. That's right.

Q. And LOL means 'laugh out loud'. Is that correct?

A. That is also my understanding.

Q. And if I do the math, if you go from 8.4 million a quarter to 1.5 million a quarter in supply, that's about an 83 percent cut. Does that sound right?

A. Yes.

Q. What would happen to Samsung's business if it suddenly couldn't supply 83 percent of its customers?

A. I think it would be very difficult.

Bench Trial Tr. (Indong Kim) at 154:6-17; 155:22-156:3; 157:2-18.

[FF.II.123]     A central focus of Defendants' litigation strategy was to keep out any evidence regarding its behavior under the parties' JDLA, and Mr. Kennedy's analysis of the multi-billion dollar value of the JDLA.  Notably, this Court did not exclude Mr. Kennedy's analysis of the value of the JDLA at the motion to strike phase, or the motion in limine phase.  *See* Dkt. 432 at 11 ("The MIL [to exclude improper argument or evidence regarding the alleged value of the supply agreement to Netlist under the JDLA] was **DENIED-IN-PART** as to Mr. Kennedy and Mr. Meyer. (Dkt. No. 427 at 216:24–217:4; *id.* at 217:23–218:3.) The Court **GRANTED** the MIL as to anyone aside from Mr. Kennedy and Mr. Meyer on the topic of the value of the supply agreement to Netlist under the JDLA. (*Id.* at 217:5–13; *id.* at 218:2–3.)").  Nonetheless, the Court prevented Mr. Kennedy from presenting this analysis at the jury trial.

(7)     *Mr. Halbert Admitted that His "JEDEC" Analysis Had No Nexus to the Patents in Suit*

[FF.II.124]    At the bench trial, Mr. Halbert presented an analysis of the differential amount of contributions Samsung and Netlist made to JEDEC.  Bench Trial Tr. (Halbert) at 19:23-20:13.

[FF.II.125]    On cross-examination, Mr. Halbert admitted that he could not identify any element of the patents in suit that had their source on JEDEC or Samsung's work at JEDEC:

> And you actually -- you did not take any claims of the patents and identify any element of that claim that had its source in JEDEC or Samsung's work at JEDEC. Correct?

> A. Correct.

Bench Trial Tr. (Halbert) at 23:4-7.

[FF.II.126]    Because both parties agreed that the patents in suit were not standard essential, given that neither liability expert had used or relied on JEDEC specification, and given the admitted lack of nexus between the "JEDEC contribution" and Netlist's patent-in-suit presented in Mr. Halbert's analysis, engaging jurors in a discussion of "JEDEC contributions" would have been highly confusing and prejudicial.  The jury would have been left to conclude that contribution to JEDEC has a nexus to direct or willful infringement—even though it does not as a matter of law.  Defendants conceded at the Pretrial Conference that JEDEC is not a defense to direct infringement.  And as discussed below, Defendants never presented JEDEC as a defense to infringement.  However, there was nothing that prevented Samsung from presenting testimony on other technologies in the accused products that were not covered by the patents in suit and contributed value.  In other words, Samsung never sought to present the substance of Mr. Halbert's testimony without the prejudicial overlay of discussing it in terms of "JEDEC contributions."  Mr. Halbert could have discussed what are those technical contributions actually present in the accused

products, who created them, or how they contributed any value to these accused products.  Mr. Calandra testified that Samsung invested $19 billion in R&D per year, and held 12,000 memory patents.  Jury Trial Tr. (Calandra) at 809:1-810:5.  Any additional development of these arguments was not limited by a ruling of the Court.  They were limited as a practical matter by the fact that Samsung ran out of time during trial.  Jury Trial Tr. at 1210:23-1211:1 (Samsung had 21 minutes remaining prior to its last redirect examination, taking into account additional time provided by the Court to Samsung in chambers).

[FF.II.127]    Moreover, Netlist as well was prevented from presenting expert testimony on JEDEC relating to damages.  Defendants moved to strike Mr. Kennedy's analysis making clear that JEDEC is not a source of innovation, but a tool that is used to take the technology of other companies:

> He also opines that the industry consortium JEDEC may be "anticompetitive" and "was unfairly taking Netlist's technology" (*id.* at ¶¶ 61, 99). These opinions are irrelevant and unduly prejudicial.

Dkt. 205 (Samsung's Motion to Strike Kennedy Report), at 13; *see also id.* at 14 (seeking to exclude, *inter alia*, paragraphs 98 and 99).  For example, the objected to section of the report observed:

> 2016 is also when Samsung began pressuring Netlist to rejoin the JEDEC Committees that it had withdrawn from based on its concerns that JEDEC was unfairly taking Netlist's technology.

> Although standardization can serve many benefits in a society, there are risks that standard settings organizations ("SSOs") can be used for anti-competitive purposes by large suppliers and customers in a given space. In particular, SSO structures can allow members of these entities to engage in so-called "hold out," where technology buyers collectively refuse to bargain with technology holders on fair and reasonable terms. . . .

Dkt. 205-1 (Exhibit A) at Report Pages 19, 33.  The Court struck these opinions at Defendants' insistence because essentiality was not in the case.  Dkt. 432 (order striking report).

[FF.II.128]     Mr. Kennedy's stricken opinions would have been directly responsive to the testimony Mr. Halbert gave at the bench trial.  This is the challenge faced when a party converts a strategic decision knowingly made at the Pretrial Conference into a claim of litigation misconduct after not prevailing in the case.  For the arguments Samsung claims it could not make there are just as many arguments it was able to avoid facing.

<div align="center">e.     Samsung's Interrogatory Responses Never Identified JEDEC as a Basis for Non-Willfulness</div>

[FF.II.129]     Samsung's counsel claimed at the bench trial that its willfulness defense was impacted by not being able to raise its participation in JEDEC and implementation of JEDEC specifications.  The Court finds that Samsung had failed to timely disclose JEDEC as a basis for its non-willfulness positions, and as such those materials would have been properly excluded from the jury trial in any event.[1]

[FF.II.130]     At the bench trial, Samsung's counsel told the Court that "So the -- at the jury trial, you know, our primary willfulness and damages defense was our cooperation with the JEDEC; the idea that Samsung had gone to JEDEC with the entire industry, and we had gotten together to define standards that would allow us all to interoperate."  Bench Trial Tr. at 158:23-159:3; *see also id.* at 163:4-10 ("But beyond that, Your Honor, if you remember back, our primary willfulness response was the essentiality and the non-essentiality of the positions of the Plaintiff. You know, our inability to lay out the JEDEC experience at large was, again, our primary willfulness response, which made it very difficult for us to be able to do that.").

---

[1] As alleged evidence of prejudice, Samsung's counsel at the bench trial identified that Netlist "moved for summary judgment of willfulness, to exclude our willfulness defenses."  Bench Trial Tr. at 164:1-5.  Netlist did not move for summary judgment relating to Samsung's willfulness defense.

[FF.II.131]    Samsung's interrogatory responses never identified its participation in

JEDEC or its sale of standard-compliant products as a basis for non-willfulness.  Netlist's

Interrogatory No. 9 sought "For each asserted claim of Netlist Patents-in-Suit that You assert Your

liability for infringement is limited, Set Forth Your Complete Basis for such assertion, including

any allegation that Your conduct is licensed or that Your behavior is not an act of making, using,

offering for sale, or selling in the United States."  Dkt. 511-02 at 116.  Samsung identified the

bases for its non-willfulness defense in a supplemental interrogatory response dated November 10,

2022.  *Id*. at 149-50.  Samsung did not identify JEDEC as a basis for non-willfulness:

> Samsung has not willfully infringed Netlist's asserted patents. Netlist bears the
> burden of establishing the entitlement to enhanced damages and a finding of
> willfulness. *Halo Elecs., Inc. v. Pulse Elecs.*, 136 S. Ct. 1923, 1934 (2016).
> Enhanced damages under 35 U.S.C. § 284 are "designed as a 'punitive' or
> 'vindictive' sanction for egregious infringement behavior," and should "not to be
> meted out in a typical infringement case." *Id.* at 1932. Netlist has not identified any
> evidence that Samsung willfully infringed the Asserted Patents, and to the extent
> Samsung had any pre-suit knowledge of the asserted patents, mere knowledge is
> insufficient.  Netlist has not identified evidence of any egregious, deliberate, or
> wanton conduct by Samsung required to prove willful infringement. "[T]he Court's
> references to 'willful misconduct' do not mean that a court may award enhanced
> damages simply because the evidence shows that the infringer knew about the
> patent and nothing more. . . . It is 'circumstanc[e]' that transforms simple
> knowledge into such egregious behavior, and that makes all the difference." *Halo*,
> 136 S.  Ct. at 1936 (Breyer, J., concurring) (quoting majority opinion).

[FF.II.132]    Samsung identified "No Willful Infringement" as an affirmative defense in

its Answer, and did not identify JEDEC as a basis for that defense.  Dkt. 25 at 43.  Netlist also

served an interrogatory seeking "Set Forth Your Complete Basis for your affirmative defenses."

Ex. 2 (Samsung's Second Supplemental Responses to Netlist's Interrogatory Set No. 2) at 41.

Samsung simply incorporated by reference "its response to Interrogatory No. 9."  *Id*. at 42.

[FF.II.133]    The Court finds that this alleged willfulness defense was not disclosed at

any time in fact discovery.  To the contrary, as discussed with respect to the Court's opinions

regarding equitable estoppel, the evidence shows that Samsung attended JEDEC meetings where

Netlist disclosed its technology to participants.

> f.    Samsung Made "Proffers" During the Trial Relating to JEDEC,
>       But Samsung Either Was Not Prevented from Introducing the
>       Evidence or Did Not Request the Introduction

[FF.II.134]    The Federal Courts have made clear that the unclean hands defense is not

appropriately used as a tool for reconsidering evidentiary rulings on which a party did not prevail

in trial and pre-trial. *See In re Prudential Ins. Co.*, 232 F. App'x 161, 166 (3d Cir. 2007) ("[W]e

must reject the [party's] attempt to relitigate this issue by raising the specter of 'unclean hands.'").

[FF.II.135]    On Friday April 14, 2023, before Netlist's first witness had left the stand,

Defendants filed a "Proffer of Excluded JEDEC Evidence." Dkt. 463. This proffer does not level

any accusation that the Court's pretrial rulings were the product of "unclean" hands. Instead, it

simply announces that "In light of the Court's ruling that Samsung may not present any evidence

or argument relating to JEDEC . . . ." *Id*. at 1. There was no per se ruling by the Court and

Defendants do not provide any citation to support the assertion that there was. This assertion is

contradicted by the fact that on April 17, 2023, Samsung cross-examined Mr. Milton on JEDEC

committee meeting minutes discussing the application of on-module power management at DDR5,

with a date before Netlist filed its claims for the '918/'054 Patents. DTX-28; Jury Trial Tr.

(Milton) at 274:9-278:17. DTX-28 is one of the documents that Defendants claim in the April 14,

2023 proffer that the Court precluded Defendants from using: "Absent the Court's evidentiary

ruling, Samsung would have presented the following evidence related to its damages, no

willfulness, invalidity due to lack of written description, and noninfringement." Dkt. 463 at 1, at

9 (Listing DTX-28 as a document the Court allegedly prevented Defendants from using). As to

the deposition designations listed in the proffer, other than Mr. Seung-Mo Jung (who Samsung

never sought to call as a witness), every listed witness was called at the jury trial, and Defendants

never sought to introduce the specific lines of testimony listed in the proffer.  *Id*. at 8.  As to the

pre-admitted exhibits listed on pages 8-9 of the proffer, there is not a single exhibit that Defendants

sought to use in examination and were precluded from doing so.  As to the "Other Evidence

Offered by Samsung, Including Impeachment Evidence," and "Netlist Party Admission," and

"Other Admissions," this list comprises over 100 separate documents.  *Id*. at 9-10.  Samsung did

not avail itself of the procedures this Court set out for additional exhibits, and Samsung did not

seek to use, much less was prevented from using, any of them in the examination of a witness.

[FF.II.136]      As to the substantive arguments in the proffer, all are addressed in sections

II.A.2a-2e with the exception of an argument relating to written description: "Samsung would have

shown that Netlist drafted its claims with reference to the JEDEC specifications, not the written

description of its patents."  As an initial matter, whether claims were drafted to cover a specific

design is irrelevant.  *Seagen*, 2022 WL 2789901, at *7 ("[t]here is nothing unusual or improper

about drafting claims to cover a competitor's product, as long as there is a basis in the pending

application," even if "that claim has never appeared before in the family"); *see also PIN/NIP, Inc.*

*v. Platte Chem. Co.*, 304 F.3d 1235, 1247 (Fed. Cir. 2002) ("[I]t is legitimate to amend claims or

add claims to a patent application purposefully to encompass devices or processes of others.");

*Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 874 (Fed. Cir. 1988) ("[T]here

is nothing improper, illegal, or inequitable in filing a patent application for the purpose of obtaining

a right to exclude a known competitor's product from the market").  Moreover, Samsung was

allowed to put into evidence DTX-28, which shows Netlist's disclosure to JEDEC of on-module

power management deliberations before Netlist filed for the '918/'054 Patent claims.  Samsung

did not seek to and was not prohibited from making any argument based on this evidence.

[FF.II.137]    On April 17, 2023, Samsung filed a supplemental proffer.  This proffer was filed on the second day of trial.   Dkt. 465.  Again Samsung states "In light of the Court's ruling that Samsung may not present any evidence or argument relating to JEDEC, Samsung makes a proffer identifying the following evidence and argument that it would have presented to the jury to support its defenses at trial . . . ."  *Id.* at 1.  Once again there is no citation evidencing that the Court made a per se ruling.  Defendants cite lines from deposition testimony of 10 witnesses.  *Id.* at 2-3.  Defendants actually played at trial 24:17-21 from Mr. Hyun-Joong Kim's deposition that Defendants claim was excluded.  Jury Trial Tr. (Hyun-Joong Kim) at 865:14-17.  Defendants did not seek permission to play any of the other listed lines of testimony. Defendants also cite to 20 documents, only eight of which were admitted exhibits that it was allegedly prevented from using on cross-examination.   Samsung did not avail itself of the procedures this Court set out for additional exhibits, and Samsung did not seek to use, much less was prevented from using, any of them in the examination of a witness.

> g.    Supplementation of Interrogatory Responses Based on Discovery Is Not Fraudulent Behavior

[FF.II.138]    As noted in Sections II.A.1.c & e (FF.II. 40-46, 66-67), Netlist and Defendants both supplemented their interrogatory responses in this case multiple times as to the issue of essentiality.  Courts in this District have repeatedly recognized that when a discovery response is supplemented late in the discovery period, if the opposing party has an issue the appropriate recourse is to seek additional discovery if needed.  *Realtime Data LLC v. EchoStar Corp.*, 2018 WL 6266300, at *6 (E.D. Tex. Nov. 15, 2018) ("With respect to Defendants' disclosures within the record of the instant case, the Court finds that Defendants have disclosed ZLIB as a non-infringing alternative. Although this disclosure was made on the last day of fact discovery, Defendants still supplemented their response to Plaintiff's interrogatory within the

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period of fact discovery. To the extent, Plaintiff claims they suffered prejudice and needed to take additional discovery regarding Defendants' late disclosure, Plaintiff should have filed a motion seeking leave to do so. Plaintiff never filed such a motion at the close of discovery.").

[FF.II.139]    Supplementing interrogatory responses multiple times, and towards the tail end of fact discovery, is also consistent with Samsung's own practices in this District. *See Ziilabs Inc. v. Samsung Elecs. Co.*, 2015 WL 6690403, at *1, *3 (E.D. Tex. Nov. 2, 2015) ("ZiiLabs served Samsung with interrogatories in January 2015 which, among other things, asked Samsung to '[d]escribe all non-infringing alternatives You contend would have been available to You and acceptable by Your customers.' Samsung responded to those interrogatories one month later, on February 17, 2015, but did not respond to Interrogatory No. 13 by disclosing 'all non-infringing alternatives.' Samsung supplemented its interrogatory responses six times between February 17, 2015 and May 20, 2015, and only in its sixth and final supplementation did Samsung respond to Interrogatory No. 13. Samsung disclosed thirteen different non-infringing alternatives in its May 20 supplementation, including, 'not storing data with a texturing unit' and 'not keeping a record of pixels affected by a rendered primitive, and not tracking primitives to be rendered in connection with suspending reads.' Fact discovery closed the same day." (citations omitted)).

[FF.II.140]    The Court finds that both parties' supplementation of their interrogatory responses as to essentiality within the fact discovery period based on actual factual developments in the case does not constitute litigation misconduct.

B.      **Conclusions of Law**

1.      **Samsung Has the Burden to Prove by Clear and Convincing Evidence that Netlist Engaged in Egregious Misconduct, that the Alleged Misconduct Has an Immediate and Necessary Relation to Netlist's Infringement Claims, and that Samsung Was Materially Prejudiced by Netlist's Actions**

[CL.II.1]      A party asserting an unclean hands defense "bears the burden of proving by *clear and convincing evidence* that [the patent holder] acted with unclean hands." *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1374 (Fed. Cir. 2007). This defense is "reserved for extreme circumstances." *Erfindergemeinschaft UroPep GbR v. Eli Lilly & Co.*, 2017 WL 275465, at *7 (E.D. Tex. Jan. 20, 2017). It requires a showing that the patent holder has engaged in "egregious misconduct," such as "perjury," "suppression of evidence," "manufacture . . . of evidence," or "bribery." *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1293 (Fed. Cir. 2011); *see also Erfindergemeinschaft*, 2017 WL 275465, at *7 ("[T]he defendant 'must show that the patentee conducted itself as to *shock the moral sensibilities* of the judge, or . . . that the patentee's conduct was *offensive to the dictates of natural justice*.'" (emphasis added)). Further, the alleged misconduct must have an "*immediate and necessary* relation" to the patents-in-suit, i.e., it must "have enhanced the claimant's legal position as to either the creation or enforcement of the legal right at issue." *Gilead Scis., Inc. v. Merck & Co.*, 888 F.3d 1231, 1239-40 (Fed. Cir. 2018).

[CL.II.2]      *Gilead*, upon which Samsung relies to bring its unclean hands defense, provides an illustrative example of the sort of egregious conduct that constitutes unclean hands. There, the patentee deliberately "violat[ed] a clear 'firewall'" agreement when it improperly used information that one of its scientists had obtained from another company to file narrowed patent claims. *Id.* at 1240. This misconduct had the effect of "expediting patent issuance and for lowering certain invalidity risks." *Id.* at 1241. At deposition, this scientist deliberately lied about his

participation in the call and then gave additional "intentionally false" testimony both at deposition

and at trial in support of the patentee's validity positions. *Id.* at 1244. Because the scientist's

violation of the firewall played a "significant role" (*id.* at 1243) in the patentee's acquisition of the

patents at issue and his subsequent false testimony had "significant potential to give [the patentee]

an advantage in the litigation," the court concluded that the patentee had acted with unclean hands.

*Id.* at 1247.

[CL.II.3]       An unclean-hands defense further requires proof that the offending conduct

materially prejudiced a party's ability to defend itself. *See Midwestern Cattle Mktg., L.L.C. v.*

*Legend Bank, N.A.*, 800 F. App'x 239, 246 (5th Cir. 2020) ("[T]he unclean hands defense is

inapplicable altogether where the plaintiff's sins do not affect or prejudice the defendant.")

(quoting *Bank of Saipan v. CNG Fin. Corp.*, 380 F.3d 836, 842 (5th Cir. 2004)); *Republic Molding*

*Corp. v. B.W. Photo Utilities*, 319 F.2d 347, 349–50 (9th Cir. 1963) (in applying the unclean hands

defense, "the extent of actual harm caused by the conduct in question" is "a highly relevant

consideration"); *PenneCom B.V. v. Merrill Lynch & Co., Inc.*, 372 F.3d 488, 493 (2d Cir.2004)

(unclean hands defense requires proof that the plaintiff "has injured the party attempting to invoke

the doctrine").

### 2.    Samsung Has Failed to Prove By Clear and Convincing Evidence That Netlist Engaged in Egregious Misconduct

[CL.II.4]       Samsung at the bench trial did not identify any fraudulent statement made

by Netlist in this case.  Rather, Samsung's unclean hands defense is based on a change in position

Netlist made during fact discovery based on fact discovery.

[CL.II.5]       In this case, to the extent Netlist did change its position regarding the

essentiality of the '339, '918, and '054 patents, that change in position does not constitute litigation

misconduct.  As discussed in section II.A.a and II.A.d above, there was a substantial factual basis

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for Netlist to conclude that the patents were not standard essential based on the testimony of Samsung's technical witnesses.  Netlist supplemented the relevant interrogatory response to contend that the patents were not essential less than a month after taking its initial position that the patents were essential, approximately a month after Samsung contended in an interrogatory response that the patents were not essential, and five days after the Court entered its claim construction order, a portion of which implicated one of the reasons why the patents may not be essential.

[CL.II.6]     In addition, contrary to what Samsung has repeatedly told this Court, Netlist did not change positions on the "eve of trial."  Dkt. 509 at 8.  Rather, more than two months before trial was set to begin, Netlist told this Court and Samsung in briefing that "neither side plans to address" essentiality at trial, that "Netlist's experts will not argue that the patents are essential to and therefore infringed by any entity practicing the standard," that "Netlist will show on an element by element bases why Samsung's specific accused designs infringe," and that "the jury will not make a determination of whether the patents-in-suit are essential or not essential."  Dkt. 214 at 6.  This is exactly how the trial progressed.  Thus, Netlist's positions regarding the essentiality of its patents does not constitute litigation misconduct that can support a finding of unclean hands.

[CL.II.7]     Netlist's actions are not the kind of egregious misconduct for which courts have found unclean hands, nor do they shock the Court's moral sensibilities as is required to find unclean hands.  To the contrary; a finding of unclean hands in this case could chill litigants' willingness to acknowledge that their positions are no longer tenable based on facts developed in the case.

3.     **Samsung Has Failed to Prove by Clear and Convincing Evidence That Any Alleged Misconduct Had an Immediate and Necessary Relation To Netlist's Infringement Claims In This Case**

[CL.II.8]     Samsung has not shown by clear and convincing evidence that Netlist's actions have an immediate and necessary relation to Netlist's infringement claims for the '339, '918, and '054 patents.

[CL.II.9]     As the Federal Circuit explained in *Gilead*:

The Supreme Court has articulated the governing legal standard. In *Keystone Driller Co. v. General Excavator Co.*, the Court explained that a determination of unclean hands may be reached when 'misconduct' of a party seeking relief 'has immediate and necessary relation to the equity that he seeks in respect of the matter in litigation," i.e., 'for such violations of conscience as in some measure affect the equitable relations between the parties in respect of something brought before the court.' 290 U.S. 240, 245, 54 S.Ct. 146, 78 L.Ed. 293 (1933). In *Precision Instrument Manufacturing Co. v. Automotive Maintenance Machinery Co.*, the Court stated that the doctrine 'closes the doors of a court of equity to one tainted with inequitableness or bad faith relative to the matter in which he seeks relief, however improper may have been the behavior of the defendant,' and requires that claimants 'have acted fairly and without fraud or deceit as to the controversy in issue.' 324 U.S. 806, 814–15, 65 S.Ct. 993, 89 L.Ed. 1381 (1945).

*Gilead*, 888 F.3d at 1239–40.

[CL.II.10]     The "immediate and necessary relation" standard requires that the alleged misconduct must "have enhanced the claimant's legal position as to either the creation or enforcement of the legal rights at issue." *Gilead*, 888 F.3d at 1240.

[CL.II.11]     The only evidence Samsung has pointed to in support of its argument is its claim that it was prevented from presenting "evidence and defenses" it developed for trial.  Dkt. 509 at 10.  There is no clear and convincing evidence supporting this assertion.  Defendants contended the patents were not standard essential.  Although at the bench trial Defendants claimed this was for the same reason they claimed the patents were not infringed, that is not apparent from their interrogatory response.  Their interrogatory response simply states the patents are not essential.  And the interrogatory response does not state that if the patents are infringed, they are

necessarily essential.   Netlist agreed with Defendants' contention that the patents were not essential.   Agreeing with Defendants is the opposite of misconduct that enhances the position of Netlist, because as a matter of logic agreeing with Defendants assists the Defendants.   Moreover, as discussed above in, e.g. II.A.2.c.(2) (FF.II.86-94), an acceptance by Netlist that the patents are not essential immunized Defendants from significant cross-examination.

### 4. Samsung Has Failed to Prove By Clear and Convincing Evidence That It Suffered Any Prejudice

[CL.II.12]     Samsung has not proven by clear and convincing evidence that it suffered material prejudice due to the alleged misconduct.

[CL.II.13]     Samsung made a strategic litigation decision to accept Netlist's position of non-essentiality, and actually benefited from that position by being able to avoid cross-examination of its witnesses on Samsung's non-infringement positions in light of JEDEC documents and the admissions of its corporate representatives.

[CL.II.14]     Further, Samsung has suffered no prejudice with respect to its damages case. As discussed in section II.A.2.d above, Samsung presented the same damages analysis for all patents in suit, including for the '060/'160 patents, which neither party at any point in time contended were essential.

[CL.II.15]     As also discussed above, Samsung sought to introduce settlement communications and an expert analysis from a prior litigation in support of its RAND positions. The Court excluded those documents at the Pretrial Conference, and the Court's decision had no connection to the alleged misconduct Samsung identifies here.   Rather, the Court relied on Rules 408 and 403 of the Federal Rules of Evidence to exclude that evidence from the jury trial.   Thus, that evidence could not form the basis of any claim of prejudice.

[CL.II.16]      Samsung has also not proven that it has suffered prejudice with respect to willfulness.  Samsung's claim that its participation in JEDEC and implementation of JEDEC specifications supported its non-willfulness defense is belied by the Court's finding that Samsung never identified JEDEC as a basis for its non-willfulness defense in fact discovery.  Samsung's claim is also belied by the fact that Samsung's JEDEC participation cuts against its willfulness position.  As explained with respect to equitable estoppel, Samsung attended JEDEC meetings where Netlist's technology was presented.  This constitutes, at a minimum, circumstantial evidence of Samsung's knowledge of Netlist's patents.

[CL.II.17]      At no time did the Court preclude Samsung's counsel from approaching the bench during the jury trial and seeking permission to cross-examine, for example, Netlist's infringement expert Dr. Mangione-Smith on JEDEC standards documents.  As such, Samsung did not preserve an argument that it was prejudiced by Netlist's alleged misconduct, nor does it have any evidence (beyond attorney argument) that it would have introduced different evidence.  Samsung approached and successfully sought leave to introduce JEDEC material.  And a large number of JEDEC specifications were pre-admitted.  Samsung never sought to use them.

### 5.      The Balance of Equity Does Not Favor a Finding of Unclean Hands

[CL.II.18]      Because unclean hands is an equitable defense, the Court also needs to weigh the equities.  *Core Wireless*, 899 F.3d at 1368 ("an equitable defense hinges on basic fairness") (internal quotation marks omitted).  "[T]he task of applying an equitable defense is [also] committed to the district court's discretion," meaning it can decline to apply the defense even if there is unclean hands.  *Id*. at 1369.  In addition to failing to establish all (or any) elements of the unclean hands defense, the following additional factors disfavor holding the patents-in-suit unenforceable or otherwise barring Netlist's infringement claims.

[CL.II.19]    Samsung has not proven by clear and convincing evidence that the patents-in-suit are essential to any JEDEC standards.  This is the case even if the issues on which Samsung disputed infringement are decided all in favor of Netlist.  In the absence of proof, it was proper for the jury not to hear allegations of essentiality that neither side believed any patent-in-suit is standard essential.

[CL.II.20]    For every argument Defendants asserts it could have made if essentiality was in the case, there is just as much evidence regarding damaging arguments it was able to avoid by essentiality not being in the case.  Defendants are represented by highly sophisticated counsel who made a strategic decision to affirmatively assert that the patents-in-suit are not essential during discovery, to not move to strike Netlist's supplemental interrogatory response which agreed with Samsung's position, and to accept that both parties agreed the patents were not essential at the Pretrial Conference.  *See e.g. supra*, II.A.2.b.

[CL.II.21]    In short, granting the relief that Samsung is now seeking would create a troubling precedent: based on facts that were elicited in the case, Netlist agreed with Samsung that the patents were not essential.  This issue was fully briefed and discussed at the Pretrial Conference and the Court issued a ruling based on the parties' agreement.  It cannot be the case that every time a party is dissatisfied with the outcome at trial, it can convert an agreement reached at a Pretrial Conference that it apparently now regrets into a basis to vacate a jury verdict.

### III.   PROSECUTION LACHES

#### A.   Findings of Fact

##### 1.   The Jury Found that Samsung's DDR5 Memory Products Infringed the '918 and '054 Patents and Rejected Samsung's Invalidity Arguments that Were Based on the Delay in Obtaining Claims

[FF.III.1]      During the jury trial, Samsung argued that the '918 and '054 patents are invalid for lack of written description because the claims departed from the essential elements of the invention as described in the specification and that the passage of time before obtaining the patents is evidence of a misuse of the patent system.  For example, Samsung's expert witness, Mr. McAlexander testified:

> Q. Now, do you also have an opinion as to whether the '918 and '054 Patent claims are invalid for failing to satisfy written description?
>
> A. Yes, I do.
>
> Q. What is that opinion?
>
> A. I've looked at the entirety of the specification in the claims, and I've come to the conclusion that the written description for the '918 and '054 Patents, which I'm talking about the text and the illustrations, do not support the asserted claims. I've identified three reasons. One is the claims fail to require the flash DRAM hybrid structure as a memory module. Secondly, the claims fail to require data transfer between the flash and the DRAM memory module -- memory devices on that module. And, third, the claims fail to require backing up the data between the flash and the DRAM, which is the focus of the intent of the specification.
>
> Q. Going back to the '918 and '054 title of the patents, what does the title tell you about what was described in the '918 and '054 patents?
>
> A. Both patents are directed to a hybrid memory module that includes both flash and DRAM on that module.
>
> Q. Do any of the claims that are asserted in this claim, do they require flash?
>
> A. None of them do.

Jury Trial Tr. (McAlexander Direct) at 899:7-900:6.

> Q. Now, we heard that the '918 and '054 Patents are continuation patents?
>
> A. Yes, that's correct.
>
> Q. Do you have continuation patents yourself?
>
> A. Oh, yes.

Q. Is that an okay thing to do?

A. Yes.

Q. But are there limits?

A. Yes. Still have to stay true to the invention.

Q. And what do you mean by that?

A. What I mean is, is that when you originally file in 2007 in this case the provisional application and the continuations, you have to maintain the specification on a continuation, and what you change then is the claims that are directed to that. But it still has to fall within the scope of what is -- what the patent is about.

Q. And if the claims that no longer match up with the specification, would those claims be valid or invalid?

A. Invalid.

Jury Trial Tr. (McAlexander Direct) at 906:15-907:8.

Q. So ultimately what is your conclusion then as to why the '918 and '054 Patent claims have no support in the patents and therefore are invalid?

A. Well, as I said in my testimony earlier, I said there were three particularly primary fundamental aspects that the written description is directed to. I did my evaluation, and my conclusions confirm that initial thought.  And the statements are: the claims are invalid because they fail to require the flash-DRAM hybrid structure, the claims are invalid because they fail to require data transfer between flash and DRAM memory devices, and the claims are invalid because they do not require backing up data between flash and DRAM.

Jury Trial Tr. (McAlexander Direct) at 908:20-909:7.

[FF.III.2]      Samsung repeated the same argument during closing:

And we know that they filed continuation after continuation. And there's nothing wrong with continuation practice. I tried to make that clear in my opening that that's allowed under the rules. What you can't do, what you can't do, is keep filing these continuations and take the patent further and further and further away from what you actually told the Patent Office, that you wrote down in your written description. Because when you do that, ladies and gentlemen, the patent is invalid.

And here we see there was over 13, almost 14 years between the time that they filed that initial disclosure and the -- the first -- the '918 Patent issued.

Jury Trial Tr. at 1350:3-14.

[FF.III.3]    The jury rejected these arguments. Defendants are attempting to re-package the same argument via the doctrine of prosecution laches.

### 2. Netlist Provided a Reasonable Explanation for the Prosecution Decisions that Led to the Timing of the '918 and '054 Patents

[FF.III.4]    The first non-provisional utility application that the '918 and '054 patents claim priority to is App. No. 12/131,873, filed on June 2, 2008. *See* JTX0003; JTX0004. On September 29, 2008, Netlist filed a continuation, App. No. 12/240,916 ("the '916 Application"). In its first substantive action, the PTO issued a restriction requirement requiring Netlist to elect only a subset of its originally filed claims for prosecution. PX1816 at 118-24. The PTO identified claims drawn to a voltage conversion module as a distinct invention separate from claims directed to a combination of volatile and non-volatile memory. PX1816 at 0120.

**Election/Restrictions**

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I.      Claims 1-20, and 43-49, drawn to a non-volatile and a volatile memory
        systems, classified in class 711, subclass 100 and 104.

II.     Claims 21-36, drawn to a power module for a volatile and non-volatile
        memory including a voltage conversion element, classified in class 327,
        subclass 51; class 365, subclass 242; and class 714, subclass 721.

III.    Claims 37-42 drawn to non-volatile and a volatile memory systems
        wherein the memory systems operate at different frequencies depending
        on the mode of operation classified in class 715, subclass 745, 789, 811.

IV.     Claims 50-54, drawn to restoring data, classified in class 707 subclass
        679, 680, 681.

The inventions are distinct, each from the other because of the following reasons:

        Inventions I and II are related as subcombinations disclosed as usable together
in a single combination.  The subcombinations are distinct if they do not overlap in
scope and are not obvious variants, and if it is shown that at least one subcombination
is separately usable.  In the instant case, subcombination II has separate utility such as
use in a system where a voltage conversion element is used for convert operational
voltage in order to operation in different modes.  See MPEP § 806.05(d).

[FF.III.5]      Consistent with the PTO's conclusion of separate utility, the originally filed

claim 21 in Netlist's '916 Application recited a "power module" in the preamble, which is

referenced as useable in "a memory system comprising non-volatile and volatile memory."

PX1816 at 0038.  But that passage from the preamble referencing "non-volatile and volatile

memory" does not appear to be limiting because it makes no other appearances in the claim.

PX1816 at 0038.[2]

---

[2] Defendants do not assert this claim is a Potentially Essential Patent Claim under the
JEDEC Patent Policy.

21. A power module for providing a plurality of voltages to a memory system comprising non-volatile and volatile memory, the plurality of voltages comprising at least a first voltage and a second voltage, the power module comprising:

an input providing a third voltage to the power module;

a voltage conversion element configured to provide the second voltage to the memory system;

a first power element configured to selectively provide a fourth voltage to the conversion element;

a second power element configured to selectively provide a fifth voltage to the conversion element, wherein the power module is configured to selectively provide the first voltage to the memory system either from the conversion element or from the input, wherein the power module is configured to be operated in at least three states comprising:

a first state in which the first voltage is provided to the memory system from the input and the fourth voltage is provided to the conversion element from the first power element;

a second state in which the fourth voltage is provided to the conversion element from the first power element and the first voltage is provided to the memory system from the conversion element;

a third state in which the fifth voltage is provided to the conversion element from the second power element and the first voltage is provided to the memory system from the conversion element.

[FF.III.6]    In light of the examiner's guidance, Netlist elected to first prosecute Group 3 in the '916 Application. PX1816 at 142 (noting withdrawal of claims 1-36 and 43-54).

[FF.III.7]    Netlist is a product company and applies for patents based on its product development roadmap. Netlist's Vice President of Engineering, Mr. Scott Milton, testified:

> Q. What was your role in the preparation of the patents on which you're an inventor?
>
> A. All right. So just a little bit on -- on how we develop patents. So as an engineer working along with my colleagues, we'll come up with -- with ideas as we work to design our products. And what we'll do is we'll meet with some, you know, professionals in the area. You know, I myself am not a lawyer. I don't know all of the details of how you write the final patent. But what we do provide is all of the technical details.

Jury Trial Tr. (Milton) at 198:9-18.

[FF.III.8]       Mr. Milton testified that Netlist developed on-module power management initially used for non-volatile DIMM ("NVDIMM") products, but is now using it in DDR5 DIMMs.   *See* Jury Trial Tr. (Milton) at 204:8-11 ("[W]e developed that on-module power management that we use for our NV products is now being used on the DDR5 products.").

[FF.III.9]       Mr. Milton testified that Netlist designed and is in the process of launching its own DDR5 module with on-module power management.

> Q.  Netlist is now working on a low profile DDR5 product.  Isn't that right?
> A.  That is correct, sir.
> Q. Is that the one you showed the jury?
> A. Yes, sir.
> Q. Okay.  And a low profile DDR5 product is different than the DDR5 DIMM products that are accused of infringement in this case.  Right?
> A. It has a different form factor.  That is true.
> Q. So it's different.  Correct?
> A. In form factor, yes.
> Q. And Netlist does not make or sell its own DDR5 RDIMM.  Correct?
> A. The VLP is an RDIMM, sir.
> Q. A DDR5 RDIMM, sir.
> A. The VLP is a DDR5 RDIMM.

Jury Trial Tr. (Milton Cross) at 231:12-232:2.

[FF.III.10]      This design and launch of Netlists' DDR5 products are proximate to when the claims for the '918 and '054 patents were originally filed on December 30, 2020 and May 24, 2021.  JTX0003 at 1; JTX0004 at 1.  Therefore, obtaining the patents would allow Netlist to enforce its rights in the on-module power management memory module market that was beginning to develop and in which it was beginning to market products.

### 3. There Was No Delay in the Prosecution of the '918 and '054 Patents or Their Predecessors

[FF.III.11]   During the prosecution of the '918 and '054 patents, Netlist sought expedited examination of these applications. *See* JTX0021 ('918 File History) at 113, 138 (showing request for prioritized examination was submitted); JTX0045 ('054 Certified File History) at 2 (showing request for prioritized examination). Both patents issued within a year after the applications were filed. *See* JTX0003 at 1 (cover showing application filed on December 30, 2020, and the patent was issued on May 25, 2021); JTX0004 at 1 (showing the application was filed on May 24, 2021 and the patent was issued on Jan. 25, 2022.)

[FF.III.12]   Between September 2008 and 2022, Netlist prosecuted a number of applications in the patent family. Those in yellow highlighting reflect the direct chain of priority to the '918 and '054 patents.
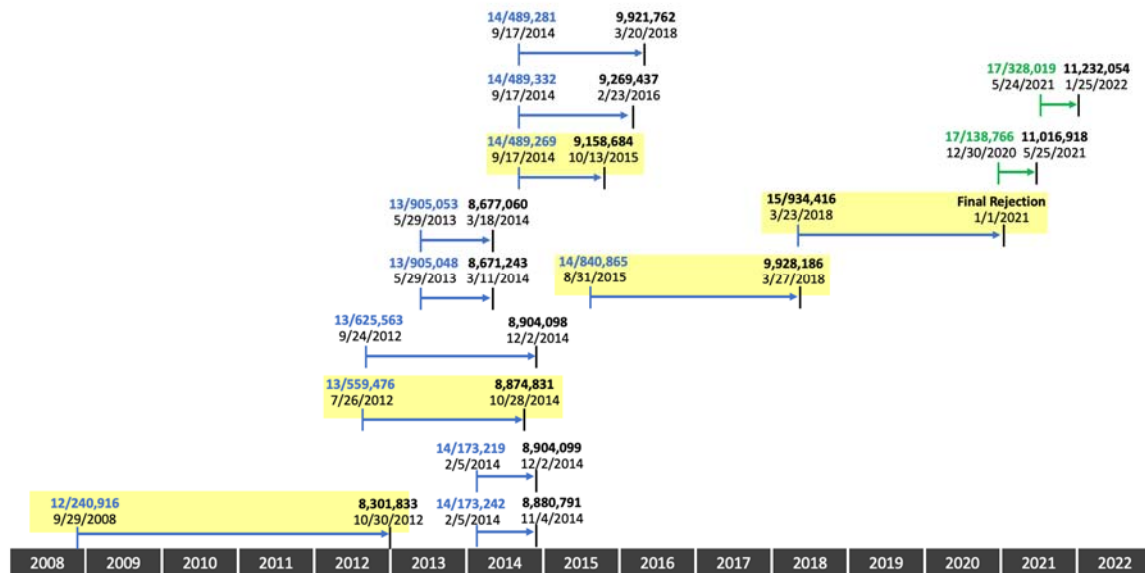


[FF.III.13]   There was only one instance in which Netlist did not obtain a patent, and that was because of a final rejection. Defendants do not identify any improperly dilatory prosecution tactics associated with any of these applications.

[FF.III.14]    At the bench trial, Mr. McAlexander testified that in his view, Netlist's first

six applications were directed to "hybrid memory module" technology:

> Q. Now, were the claims of the first six applications in the family directed to what technology?
>
> A. The claims of the six intervening patents were directed to the hybrid technology. Specifically I'm showing here for the '873, the '916, and the '476 Patent applications, specifically respectively DDX 201, 202, and 203, in every case the patent claims are directed to a hybrid memory module, including non-volatile and volatile memory.
>
> Q. And with respect to the other three in your list of six, is it the same?
>
> A. The same. These are shown as DDX 204, 205, and JTX 50 at page 55; in every case hybrid technology.

*See* Bench Trial Tr. (McAlexander) at 91:11-22.

[FF.III.15]    According to Mr. McAlexander, in 2019, Netlist improperly removed the

"hybrid memory" limit in its claims to cover more products, such as Samsung's accused DDR5

DIMMs:

> Q. Now, with respect to the '918 Patent, which was the continuation of the '416, did the '918 claims recite hybrid memory?
>
> A. No. There's no hybrid memory in any of the claims of the '918 Patent.
>
> Q. And how about the '0[54]?
>
> A. Same--no hybrid memory.

*See* Bench Trial Tr. (McAlexander) at 92:7-13; JTX0003 (the '918 patent); JTX0004 (the '054

patent).

[FF.III.16]    As discussed above, the same arguments made by Mr. McAlexander at the

bench trial have been rejected by the jury.  FF.III.1-3.

[FF.III.17]    According to Netlist's expert witness, Dr. Mangione-Smith, Netlist's filing

of continuation patents is a common practice.  For example, Dr. Mangione-Smith testified at the

jury trial:

> Q. And can you explain how the continuation process works?

A. Sure.  So basically what happens, as I understand it, I'm not an attorney, is an inventor or a company will file a patent application.  And the Patent Office will come back and say, we're applying restrictions, which means, we think there's two sets of related -- of unrelated inventions, there's two sets of inventions that should be continued independently.

And so a company will say, okay, we'll immediately continue with set A, and we'll follow up with set B as a continuation.

. . .

Q.  So in your experience continuations are common practice.

A. They are very common, yes.

 *See* Jury Trial Tr. (Mangione-Smith) at 322:5-15; 324:1-3.

[FF.III.18]       Dr. Mangione-Smith also explained that Samsung took a similar approach

in filing continuation patents to their original provisional applications:

Q. Now, does Samsung use the continuation process?

A. Sure.

Q. Could you show us some examples?

A. I'd be happy to.  I no longer appear to have control of the slides.

Here is the '509 Patent from Samsung, and you'll see that I've highlighted that this was a number of different continuations.  And, in fact, from when they first filed their application until that '509 Patent issued, it covered 16 years.
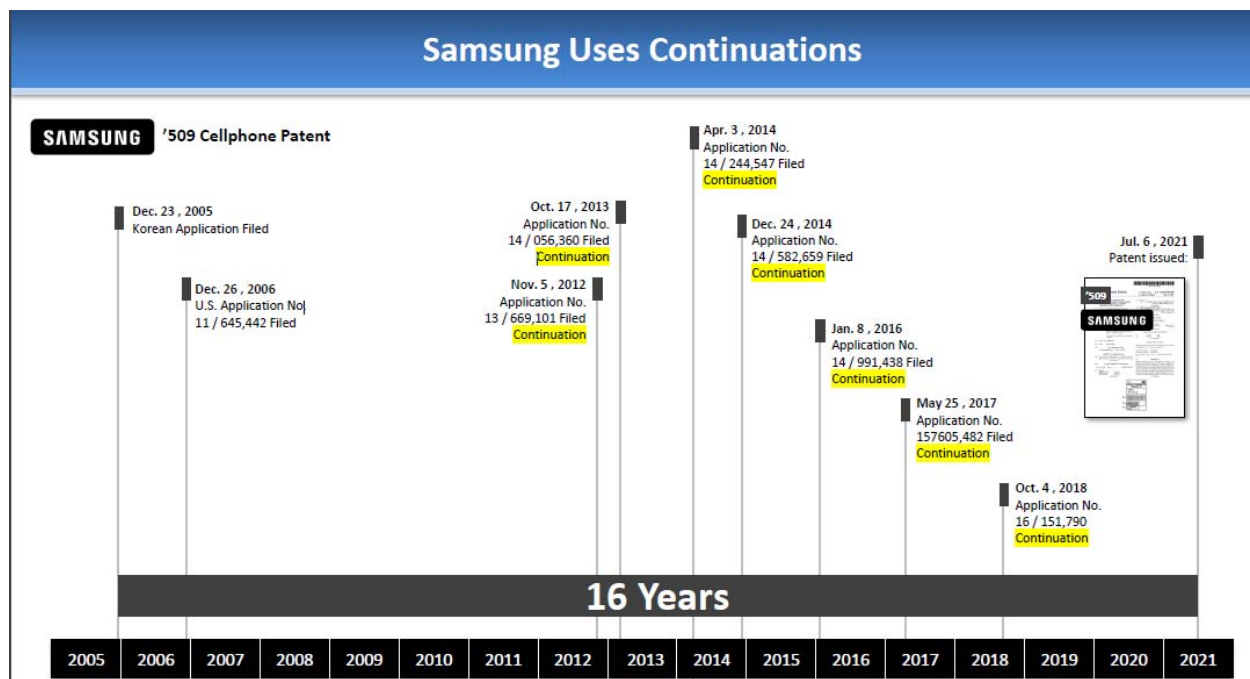
Q. Any other examples?

A. Indeed.  If we flip forward. . . . This is the '894 Patent.  You'll see it also is a continuation of a set of continuations.  And, in fact, since the original application was filed for this patent until the '894 issued, it spanned 14 years. Here's the '700 Patent, which, again, was a continuation. And from the time the original patent was filed until that patent issued, it spanned 13 years.
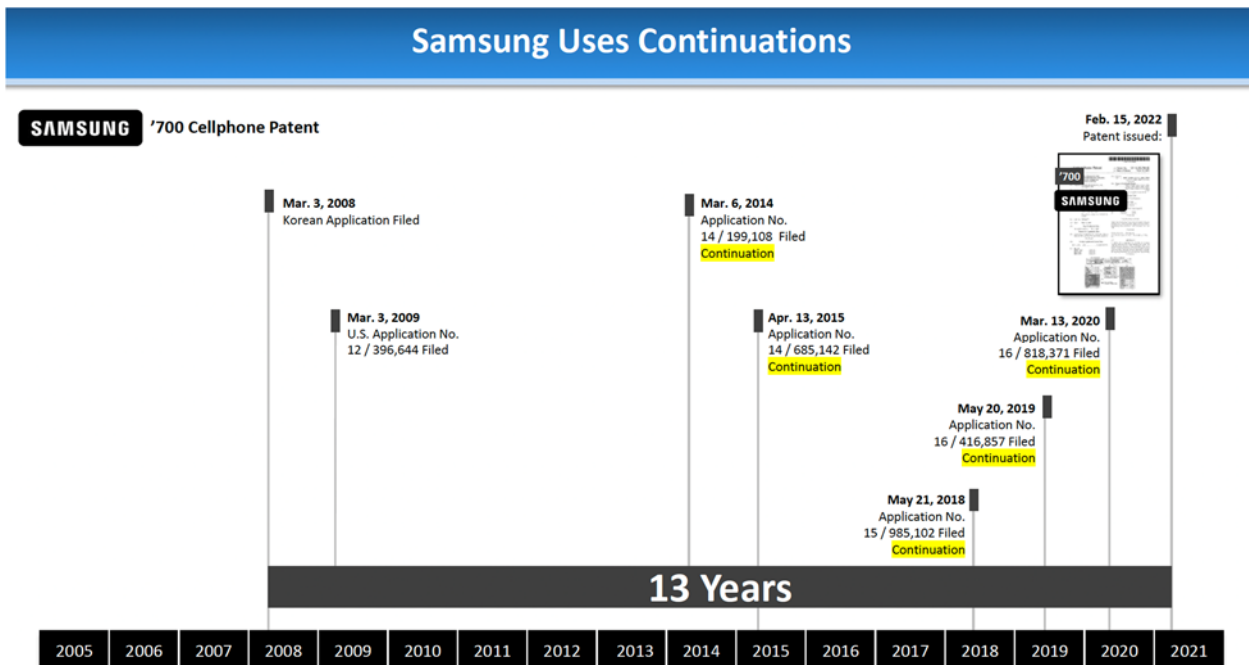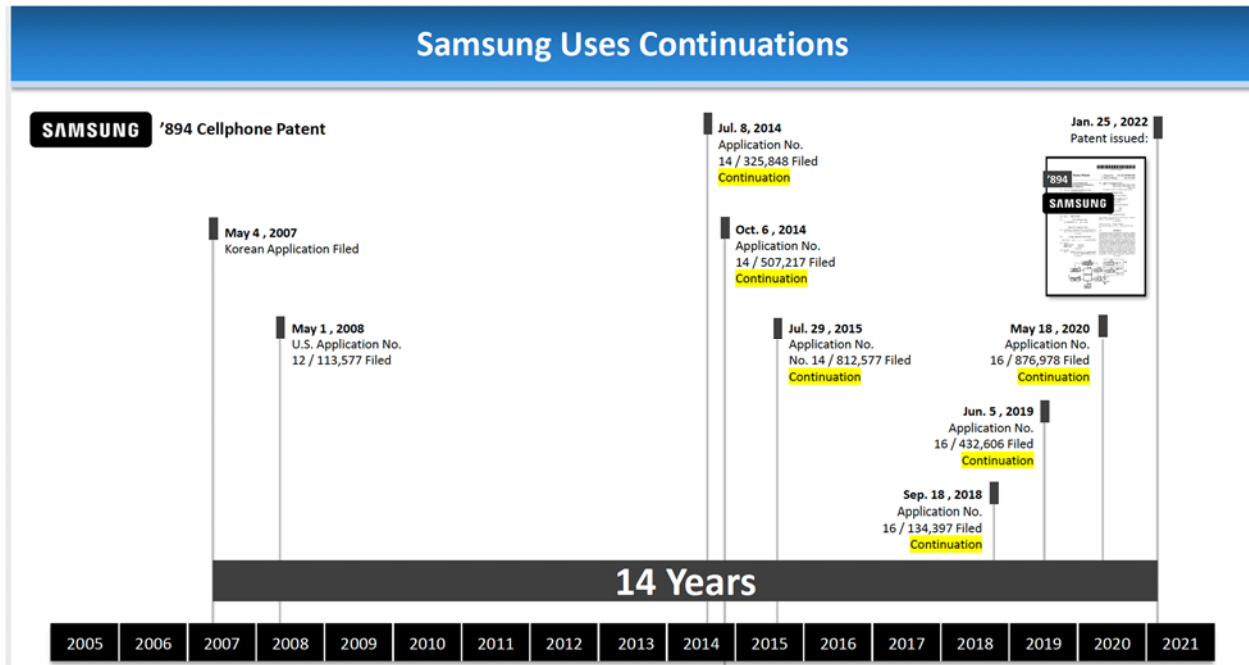
*See* Jury Trial Tr. (Mangione-Smith) at 323:2-25.

### 4.   Netlist's Disclosed the '918/'054 Patent Family to JEDEC

[FF.III.19]      Mr. McAlexander alleged Netlist changed the scope of the claims of the

'918 and '054 patents to remove the "hybrid memory" limitation after Netlist's representatives

attended JEDEC meetings relating to DDR5 specifications:

> Q. Now, what happened after Netlist attended the JEDEC meetings that it attended, as shown here on slide 21?  What did Netlist do after that?
>
> A. Well, as I've shown on the previous timeline slide, JEDEC meetings were attended by Netlist in December 2018, March and June of 2019.  I've highlighted that as DTX 14, 33, and 34, and then JTX 50 at page 214 shows that the '416 application that was amended, the claims were amended and the hybrid memory portion was eliminated.
>
> Q. Now, with respect to the '918 Patent, which was the continuation of the '416, did the '918 claims recite hybrid memory?
>
> A. No. There's no hybrid memory in any of the claims of the '918 Patent.
>
> Q. And how about the '0[54]?
>
> A. Same--no hybrid memory.

Bench Trial Tr. (McAlexander Direct) at 91:23-92:13.

[FF.III.20]      Mr. McAlexander opined that Netlist's delay in filing the '918 and '054

patents and change of their claim scopes are "unreasonable and inexcusable" because the claims

were not identified to JEDEC.

> Q. Now, in light of what we just went over, why is Netlist's delay in filing the claims of these patents unreasonable and inexcusable?
>
> A. Because they changed -- with the amended claims, they certainly changed the entire direction of the claims from hybrid technology to non-hybrid technology, and this would not have put -- by not identifying these claims when they were applied for to JEDEC, and even when they were published, and even up to today they have not identified them as essential, that has prejudiced the entire membership of the JEDEC committee, including Samsung.

Bench Trial Tr. (McAlexander) at 92:14-24.

[FF.III.21]    Pursuant to the JEDEC Patent Policy, Netlist disclosed the '831 and '833

patents to JEDEC JC-40 committee first on February 27, 2015.  *See* PX0949 at 19 (the '831 patent);

*id.* at 21 (the '833 patent).  After Netlist rejoined the JEDEC committees in August 2018, it re-

disclosed these two patents to the JC-40 committee.  PX0176 at 31, 33.   At the time of both these

disclosures, the prosecution history of the '833 patent was publicly available.  *See* 37 C.F.R.

§ 1.11(a) ("The specification, drawings, and all papers relating to the filing of: A published

application; a patent or a statutory invention registration are open to inspection by the public . . .

."). The prosecution history evidences that the PTO recognized that the patent family contained

as an independent "invention" on-module power management.  *See* Section III.A.2 (FF.III. 4).

[FF.III.22]    Netlist disclosed the family to JC-40 with reference to a ballot that

represented the discussion of on-module power management in JC-40.  *See* Section I.A.2b

("Disclosure of the '918/'054 Patent Family to JEDEC Satisfied the Patent Policy").

[FF.III.23]    Mr. Gillingham testified that any member of JEDEC that wished to

determine if there was IP covering on-module power management would have examined the

disclosures Netlist made to JC40.

> Q. If a JEDEC member were attempting to determine what patents had been
> disclosed relating to on-module power management, what committees would they
> look at?
>
> A. I think they would look first to the JC-40 committee because the JC-40
> committee standardizes components that go on to a module, but they would also
> look to the JC-45 committee because that's the committee that standardizes the
> overall module.

*See* Bench Trial Tr. (Gillingham) 138:17-24.

### 5.    Netlist Disclosed to Samsung That It Was Seeking Patents on On-Module Power Management

[FF.III.24]    Netlist and Samsung were once partners in a joint development program.

JTX-00029 (JDLA).  Before and after the entrance of the parties' Joint Development and License

Agreement, Netlist made various presentations to Samsung about its technologies, products design, as well as patents and pending applications.  In its 2014 presentation, Netlist stated that it had "patent pending" that covers "in[t]elligent on-module power management" technology. PX0621 at 28; Jury Trial Tr. (Milton) at 202:13-203:7 ("Q. This is PX 621.  Do you recognize this document?  A. Yes, I do.  Q. What is this document?  A. So this is from a presentation that was provided to Samsung.").

[FF.III.25]      The 2014 presentation also identified U.S. Patent No. 8,301,833 ("the '833 patent") which claims priority to the same provisional application as the '918 and '054 patents.
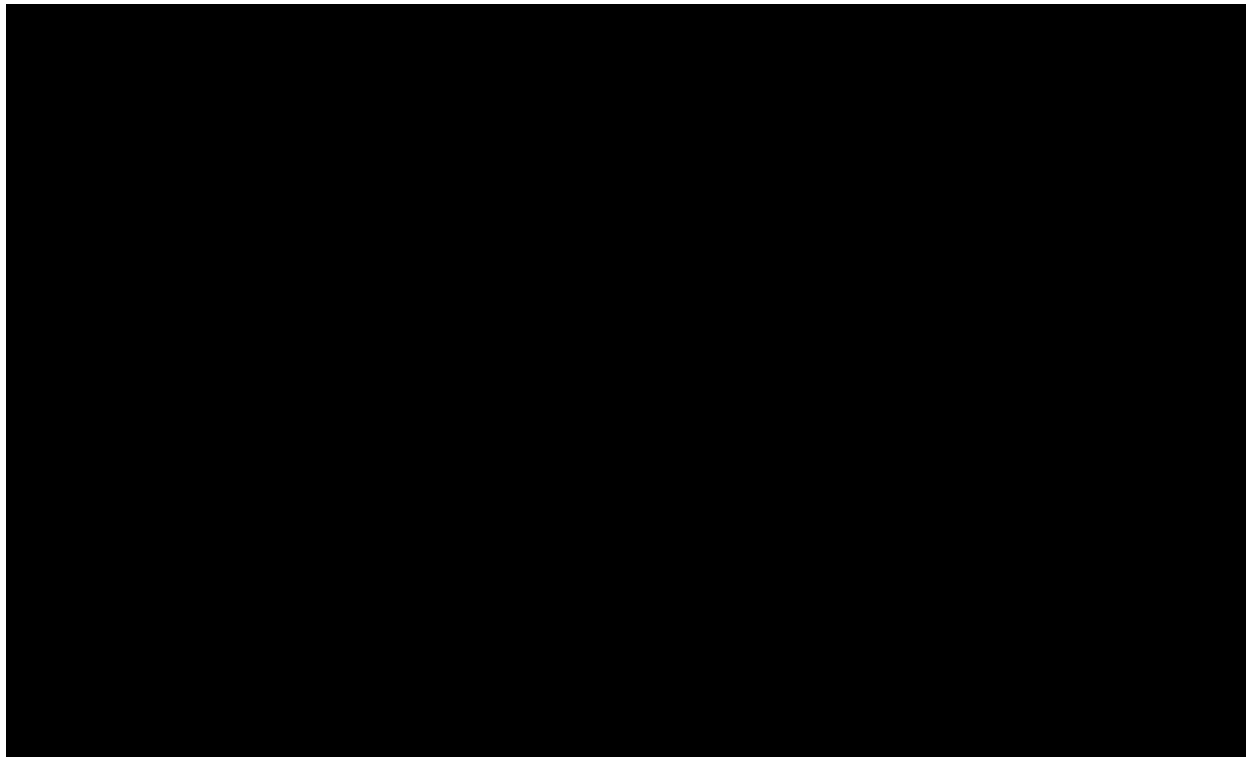


[FF.III.26]      At the jury trial, Netlists' employee Mr. Milton explained that the disclosures are relevant to Samsung's accused DDR5 PMIC technologies:

Q. And I'm going to show you a page from this document. I showed it in opening.
It says, intelligent on-module power distribution. Do you see that?
A. I do.
Q. And at top, it says, seminal patents for NV and memory channel interface?

A. That is correct.

Q. How does NV and memory channel interface relate to Samsung's DDR5 products?

A. So, as mentioned, we believe that DDR5, all modules include NV in them, and all modules include the memory channel interface.

Q. And by all modules, you mean all of Samsung's modules?

A. That is correct.

. . .

Q. (BY MR. SHEASBY) Do you believe -- do you agree or disagree with Samsung's counsel when he represented that seminal patents for NV and memory channel interface have nothing to do with Samsung DDR5?

A. Yes, I disagree with that statement. . . .

Q. (BY MR. SHEASBY) Mr. Milton, why do you disagree?

A. So I disagree because the circuitry that we developed that on-module power management that we use for our NV products is now being used on the DDR5 products.

Jury Trial Tr. (Milton) at 202:19-203:22; 204:8-11.

[FF.III.27]      Subsequently in April 2015, Netlist disclosed to Samsung U.S. Patent No.

8,874,831 ("the '831 patent") and the '833 patent, which claim priority to the same provisional

application as the '918 and '054 patents.  *See* PX0464 at 43 (chart showing patents in Netlist's

"Memory Portfolio"); *see also* Jury Trial Tr. (Milton) at 216:24-218:3. ("I want to show you a

presentation. This is PX 464. Did Netlist provide this presentation to the now president of Samsung

memory, J.B. Lee?  A. Yes, we did.  Q. And when was it provided?  A. In 2015.").

### 6.    Samsung Did Not Identify Non-Infringing Alternatives to Its Accused DDR5 Products

[FF.III.28]      There was no evidence that a commercially acceptable non-infringing

design was available.  Samsung designated testimony from Hyun-Joong Kim, its 30(b)(6) witness

on the subject of DDR5 at JEDEC, theorizing off-module power management was an alternative

Samsung could consider.

Okay. All right. First of all, as far as 1.1 volt is concerned, that does not have to be on DIMM. It could be achieved on a board through voltage regulator and a switch converter.

*See* Bench Trial Tr. (Hyun-Joong Kim) at 36:13-16.

[FF.III.29]      Mr. Kim also admitted that Defendants adopted customers demanded on-module power management.  Bench Trial Tr. (Hyun-Joong Kim) at 125:12-126:22:

Q. Let me first introduce the exhibit.  Exhibit Number 13 is JEDEC JC-40 meeting minutes for August 2016, with a beginning Bates number SAM-NET00202367.  Mr. Kim, can you please go to page 10?

A. Yes, I found that page.

Q. And it is a presentation by HP Enterprise regarding voltage regulator on DIMM?

A. Yes, that's what that looks like.

Q. And it says, "Moving forward: VR-on-DIMM is key to the DDR5 value proposition."  Do you see that?

A. Yes, I see that.

Q. Did Samsung voice any disagreement with this statement?

A. I don't recall exactly whether or not Samsung ex – expressed negative opinion at this particular meeting.  But typically when a -- a customer company make this type of presentation, we do not blatantly express a negative opinion; but, rather, at the end of the meeting, we could be discussing it with the customer separately.

Q. Do you recall discussing HP's proposal with them at the end of the meeting?

A. I don't recall whether or not that conversation took place that very day, but, rather, I do recall having had technical discussions on VR-on-DIMM with them continually.

Q. And HP was not convinced by Samsung's position.  Correct?

A. Yes.  There was a discussion regarding the value proposition, and different technology was discussed, but I believe Samsung went with -- respecting customers' opinion.

Q. Because the customer believed there was value in having voltage regulation on DIMM. Correct?

A. Yes, that's correct.

Q. And the customer believed that whatever concerns Samsung might have had regarding the cons of voltage regulation on DIMM, the benefits outweighed those concerns.   Correct?   A. Yes.   The customer continuously alleged that there are benefits.

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[FF.III.30]     Consistent with this testimony from Mr., Samsung 30(b)(6) witness as to

the availability of commercially acceptable alternatives to Netlist '054/'918 patents could not

identify any:

> Q. So for topic No. 17, which is the presence or absence of acceptable non-infringing alternatives to the inventions claimed in the Netlist patents-in-suit, what would be your testimony?
>
> A. Okay. First of all, I do not have any opinion in this -- that regard because I can give you testimony on the operation of DDR, PMIC, DDR5 PMIC. However, as to patents, I cannot render any opinion.

Jury Trial Tr. (Kyungsoo Park) at 643:10-17.

> [FF.III.31]     Samsung's damages expert Mr. Meyer affirmed the same:
>
> Q. And you didn't for the ladies and gentlemen of the jury identify any other alternative that was non-infringing and acceptable for these patents, did you, sir?
>
> A. I did not because I wasn't focused on that.

Jury Trial Tr. (Meyer) at 1215:17-20.

> [FF.III.32]     Samsung's technical expert Mr. McAlexander affirmed the same:
>
> Q. And as to the patents that are accused of DDR5, you didn't speak to any Samsung engineers to determine if there were any alternatives that were available if the Netlist technology was not used.  Correct?
>
> A. I did not communicate with any Samsung engineers.
>
> Q. And you did not do an investigation as to whether there was any acceptable non-infringing alternatives.  Correct?
>
> A. For this particular matter, no.

Jury Trial Tr. (McAlexander) at 1025:24-1026:6.

> [FF.III.33]     At the bench trial, Mr. McAlexander gave the following testimony on

alternatives:

> Q. What could Samsung and other JEDEC members have done differently had they been aware of the '918 and '054?
>
> A. Oh, they could have done considerable things differently.  Some testimony was already in the hearing today with regard to taking some of these voltage switching circuits and putting them off-module and putting them on the board.  One could

also take the required buck converter and maybe one or more of those and switching it out with an LDO.  These were possibilities that -- any one of which could have been done.

Bench Trial Tr. (McAlexander) at 85:21-86:4

[FF.III.34]     Mr. Kim confirmed that Mr. McAlexander's first proposal, of shifting power management off module, was rejected by Samsung's customers.  Mr. McAlexander's second strategy, of making changes between buck converters and LDOs, works against Defendants' case for prejudice.  As discussed in Section II.A.1.d & FF.II.56, Samsung's PMICs do not comply with the JEDEC PMIC Specification.  Consistent with this, there is no evidence of any barrier to Samsung choosing to use LDOs instead of buck converters other than commercial acceptability.  But as Mr. McAlexander testified to at the jury trial, he is unable to identify any commercially acceptable alternative.  *See* Jury Trial Tr. at 1025:24-1026:6 (McAlexander):

### B.     Conclusions of Law

#### 1.     Legal Standard

[CL.III.1]     "Prosecution laches as a defense to infringement requires proof of two elements: (a) that the patentee's delay in prosecution was unreasonable and inexcusable under the totality of the circumstances; and (b) that the accused infringer or the public suffered prejudice attributable to the delay."  *Seagen Inc. v. Daiichi Sankyo Co.*, 2022 WL 2789901, at *4 (E.D. Tex. July 15, 2022) (citing *Cancer Rsch. Tech. Ltd. v. Barr Lab'ys, Inc.*, 625 F.3d 724, 728-29 (Fed. Cir. 2010)).

[CL.III.2]     The Court applies the clear and convincing evidence standard when the enforceability of an issued patent is challenged for prosecutions laches.  *Seagen*, 2022 WL 2789901, at *4 (citing *Personalized Media Commc'ns, LLC v. Apple, Inc.*, 552 F. Supp. 3d 664, 685-86 (E.D. Tex. 2021); *SynQor, Inc. v. Artesyn Techs., Inc.*, 2011 WL 2729214, at *8 (E.D. Tex. July 13, 2011)).

[CL.III.3]      The Federal Circuit has provided a list of non-exhaustive examples of reasonable delays in prosecuting a patent, which are not sufficient basis to support a prosecution laches claim: "(i) filing a divisional application in response to a restriction requirement, even if the filing occurs immediately before issuance of the parent application; (ii) refiling an application to present new evidence of an invention's unexpected advantages; and (iii) refiling an application to add subject matter in order to attempt to support broader claims as the development of an invention progresses." *Hyatt v. Hirshfeld*, 998 F.3d 1347, 1361–62 (Fed. Cir. 2021) (citing *Symbol Techs., Inc. v. Lemelson Med., Educ. & Rsch. Found.*, 422 F.3d 1378, 1385 (Fed. Cir. 2005)).

## 2.      Netlist Did Not Take Actions to Improperly Extend the Patent Term

[CL.III.4]      Netlist did not take any actions during prosecution "to extend [its] patent term," which "is an important commonality amongst cases finding prosecution laches." *Seagen*, 2022 WL 2789901, at *7.

[CL.III.5]      Both '918 and '054 patents are subject to a 20-year term from the effective filing date of June 2, 2008, with no extensions.  *See* JTX0003; JTX0004; 35 U.S.C § 154(a)(2).  Unlike cases where prosecution laches was found, Netlist did not bulk-file hundreds of patent applications with thousands of claims to "unduly increase[] the administrative burden on the PTO" in an effort to inflate the life of its patents.  *See Seagen*, 2022 WL 2789901, at *7 (noting that "use of the patent prosecution process to extend the patent term is an important commonality amongst cases finding prosecution laches," and that "at the bench trial, [Defendant] was unable to direct the Court to any case where a court has found prosecution laches when the patentee took no action to extend the term of the patent at issue."); *Chrimar Sys.*, 2017 WL 345991, at *4-*5 (finding "that ALE did not prove [even] by a preponderance of the evidence that Chrimar is equitably estopped from enforcing the patents-in-suit based on prosecution laches" even though "ALE argues that the prosecution of the patents-in-suit started in 1998 and extended over 17 years, during which the

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IEEE standards were implemented and ALE was locked into use of the standard based on industry-wide adoption"). Among other reasons, the *Chrimar* Court noticed that "the term of the patents-in-suit are subject to a 20 year limit from 'the date on which the earliest such application was filed.' These provisions, which provide the counterbalance of limiting the life of a patent that undergoes a lengthy prosecution (by starting the term from the first filed application), alleviate the need for the equitable remedy ALE promotes based on a delayed prosecution." 2017 WL 345991, at *4-5; *cf. Hyatt v. Hirshfeld*, 998 F.3d 1347, 1364 (Fed. Cir. 2021) (reversing district court's decision because it improperly excluded, among others, evidence showing the patentee's GATT Bubble applications); *Personalized Media*, 552 F. Supp. 3d at 689 (applying prosecution laches where the asserted claims "will expire 34 years after the application was filed, 42 years after the 1987 specification, and 48 years after the 1981 patent application" and concluding that "[d]elays of this magnitude did not occur by accident and do not occur when an applicable reasonably pursues prosecution").

### 3.    Netlist Did Not Engage in Unreasonable Delay in Connection with the Prosecution of the '918 and '514 Patents

[CL.III.6]    Samsung cannot carry its burden to show by clear and convincing evidence that Netlist engaged in unreasonable delay in prosecuting the '918 or '054 patents.

[CL.III.7]    Samsung argues that Netlist waited over 13 years to file applications for the '918 and '054 patents, which claim priority to a provisional application filed in June 2007; and according to Samsung, that is too long. However, Samsung has not provided any evidence showing that it is inappropriate to file applications for continuation patents 13 years after the original provisional application was filed. Contrary to Samsung's assertion, the Federal Circuit has made it clear "there are no strict time limitations for determining whether continued refiling of patent applications" constitutes basis for a prosecution laches defense. *Symbol*, 422 F.3d at

1385; *see also Seagen*, 2022 WL 2789901, at \*7 ("DSC relies heavily on an alleged 15-year gap between the filing of the priority application and the issuance of the '039 Patent claims . . . . However, prosecution laches is not simply a time-counting exercise.").

[CL.III.8]    Netlists' expert Dr. Mangione-Smith testified that it is a common practice to file patent continuations.  Jury Trial Tr. (Mangione-Smith) at 324:1-3.  Samsung does not dispute this. *See* Jury Trial Tr. (McAlexander) at 906:18-21 ("A. Do you have continuation patents yourself?  A. Oh, yes.  Q. Is that an okay thing to do?  A. Yes").  Indeed, Samsung itself prosecuted continuation patents 16 years after the filing of the original patent.  Jury Trial Tr. (McAlexander) at 323:2-25.

[CL.III.9]    Nothing in the prosecution history shows that Netlist improperly delayed the prosecution of patents in the family.  To the contrary, Netlist has sought expedited review of these applications. *See* JTX0021 ('918 File History) at 113, 138 (showing request for prioritized examination was submitted); JTX0045 ('054 Certified File History) at 2 (showing request for prioritized examination).

[CL.III.10]    Further, between 2008 and 2022, Netlist consistently obtained patents from its prosecution, and did not engage in a practice of serial abandonment to extend the life of the family. *See* JTX-0004 at 1-2; JTX-0003 at 1-2.  This is consistent with Netlist's testimony that as a product company, it prosecuted patents based on new development its product designs. *See* Jury Trial Tr. (Milton) at 198:11-18; Bench Trial Tr. (Martinez) at 29:20-25.

> **4.     Samsung's Allegation That Netlist Drafted Claims to Cover JEDEC DD5 Implements Is Not a Proper Basis to Hold a Patent Unenforceable**

[CL.III.11]    It is a legitimate ground under the statutory scheme to file continuation patents as product development progresses. *See Hyatt*, 998 F.3d at 1361–62 (noting it is appropriate to "[refile] an application to add subject matter in order to attempt to support broader

claims as the development of an invention progresses"). The Federal Circuit has condoned broadening claims through continuation practice. *Symbo Techs.*, 422 F.3d at 1385 ("Commonly, and justifiably, one might refile an application to add subject matter in order to attempt to support broader claims as the development of an invention progresses, although entitlement to an earlier filing date for any claimed subject matter may of course be necessary to avoid a statutory bar created by intervening rights outlined in 35 U.S.C. §§ 102 and 103."); *Hakim v. Cannon Avent Grp., PLC*, 479 F.3d 1313, 1317 (Fed. Cir. 2007) ("Hakim had the right to refile the application and attempt to broaden the claims.").

[CL.III.12]   Samsung argues that Netlist improperly expanded the scope of its applications in 2019, which led to the '918 and '054 patents covering products beyond hybrid-DIMMs. According to Samsung, Netlist changed the scope of its patents "late" because its previous patent disclosures to JEDEC and patent applications filed with the USPTO did not identify these claims covering "non-hybrid technology." *See* Bench Trial Tr. (McAlexander Direct) at 92:14-24.

[CL.III.13]   However, during the jury trial, Samsung made essentially the same arguments to support its invalidity defense based on lack of written description. Specifically, Samsung argued that the provisional application to which the '918 and '054 patents claim priority is applicable only to hybrid-DIMMs and therefore cannot support the asserted claims of the '918 and '054 patents applicable also to non-hybrid-DIMMs. *See* Jury Trial Tr. at 899:7-900:6; 906:15-907:8; 908:20-909:7; 1350:3-11. In finding Netlist's patents valid and infringed by Samsung's DDR5 products, the jury has clearly rejected Samsung's lack of written description arguments. Dkt. 479 at 5 (finding Samsung cannot prove the patents-in-suit are invalid). This Court is bound by jury's fact finding in making determinations of Samsung's equitable defenses. *HTC Corp. v.*

*Telefonaktiebolaget LM Ericsson*, 407 F. Supp. 3d 631, 635–36 (E.D. Tex. 2019), *aff'd*, 12 F.4th 476 (5th Cir. 2021) ("Where there are overlapping factual issues that relate to a claim tried to a jury and a claim to be resolved by the court, the court must conduct the jury proceeding first and defer to the jury's finding on any overlapping factual issues." (quoting *Beacon Theatres, Inc. v. Westover*, 359 U.S. 500, 510 (1959); *Thermo-Stitch, Inc. v. Chemi-Cord Processing Corp.*, 294 F.2d 486, 490 (5th Cir. 1961))).  Thus, Samsung cannot rely on the alleged change of "direction of the claims from hybrid technology to non-hybrid technology" as basis to show any alleged delay in the prosecution of the '918 and '054 patents was unreasonable.  *See Seagen*, 2022 WL 2789901, at *6 (prosecution laches based on a "position that a reasonable patent applicant would view the invention of the [asserted] Patent as limited to [one particular embodiment]" fails where that position is inconsistent with the jury's findings regarding written description).

[CL.III.14]     Samsung also suggests that Netlist improperly delayed prosecution of the '918 and '054 patents until after Netlist learned the discussions of DDR5 PMIC specifications though its participation at JEDEC.  However, "[t]here is nothing unusual or improper about drafting claims to cover a competitor's product, as long as there is a basis in the pending application," even if "that claim has never appeared before in the family."  *Seagen*, 2022 WL 2789901, at *7 (quoting *SynQor, Inc. v. Artesyn Techs., Inc.*, 2011 WL 2729214, at *7 (E.D. Tex. July 13, 2011)); *see also PIN/NIP, Inc. v. Platte Chem. Co.*, 304 F.3d 1235, 1247 (Fed. Cir. 2002) ("[I]t is legitimate to amend claims or add claims to a patent application purposefully to encompass devices or processes of others."); *Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 874 (Fed. Cir. 1988) ("[T]here is nothing improper, illegal, or inequitable in filing a patent application for the purpose of obtaining a right to exclude a known competitor's product from the market").

[CL.III.15]    The Court finds that Samsung has failed to establish, by clear and convincing evidence, that the patentee's delay in prosecution was unreasonable and inexcusable under the totality of the circumstances.

### 5.    There Is No Evidence Showing that Samsung or the Industry Suffered Any Prejudice as a Result of Netlist's Purported Late Patent Prosecution

[CL.III.16]    Samsung has not shown any prejudice as a result of Netlist's purported delay in prosecuting the '918 and '054 patents.  This is another independent ground on which Samsung's prosecution laches defense must fail.  *See Cancer Rsch. Tech. Ltd.*, 625 F.3d at 729 ("We agree with Cancer Research that prosecution laches' requirement of an unreasonable and unexplained delay includes a finding of prejudice, as does any laches defense.").

[CL.III.17]    Samsung argues that Netlist's delay in prosecuting patents prejudiced Samsung and the public because "Samsung and other JEDEC members developed the DDR5 standard with a PMIC component for years while Netlist waited to file its claims."  Dkt. 509 at 13.

[CL.III.18]    However, contrary to Samsung's prejudice assertion, Samsung and other members of relevant JEDEC committees (including JC-40) were put on notice of the fact that Netlist had patented technology directed to "on-module power management" via disclosure of the '833 patent to JEDEC.  *See* FF.I.49 above.

[CL.III.19]    Samsung has not provided any evidence showing what it would do differently had Netlist prosecuted these patents earlier.  *See Shire Orphan Therapies LLC v. Fresenius Kabi USA, LLC*, 2018 WL 2684097, at *23 (D. Del. June 5, 2018) ("To show that a party was 'adversely affected,' it must show that the holder of intervening rights would have either done something differently or experienced a change in economic position as a result of the alleged delay in issuance of the patent-in-suit.") (citing *Cancer Research*, 625 F.3d at 731).  There was no

evidence that a commercially acceptable non-infringing design was available.  *See* FF.III.28 –

FF.III.34 above.

[CL.III.20]     In conclusion, Samsung fails to carry its burden to prove that the '918 and

'054 patents are unenforceable due to prosecution laches.

Dated: June 13, 2023                                    Respectfully submitted,

                                                        */s/ Jason G. Sheasby*
                                                        _____

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## CERTIFICATE OF SERVICE

I hereby certify that, on June 13, 2023, a copy of the foregoing was served to all counsel of record.

*/s/ Jason Sheasby*
Jason Sheasby


## CERTIFICATE OF AUTHORIZATION TO FILE UNDER SEAL

I hereby certify that the foregoing document and exhibits attached hereto are authorized to be filed under seal pursuant to the Protective Order entered in this Case.

*/s/ Jason Sheasby*
Jason Sheasby

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